Operator10®

Wastewater
Data Management
Software

Help

ALLMAX Software

Setting Data In Motion

Operator10 Help

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Table of Contents

Foreword 0

Part I Welcome to Operator10 - Wastewater 17

Part II Introduction to Operator10 - Wastewater 19

1 Getting Started ... 19
- Installation Overview ... 19

2 About Operator10 - Wastewater ... 22
- License ... 22
  - Keycode ... 22
- Configuration File ... 23
- Help | About ... 23
- System Properties ... 26
- Credits ... 26

3 Support ... 26
- Support Menu ... 27

4 Help File Conventions ... 27

5 Copyright ... 28

Part III General Features 30

1 Grid ... 30
- Grid Toolbar ... 30
- Grid Columns ... 36
- Grid Data View ... 38
- Grid Print ... 40

2 Multi-Edit ... 40

3 Security ... 41
- User Security ... 42
- User Facility Security ... 43
- User L:P Permissions ... 45
- Groups ... 45

4 Date/Calendar ... 47
- Relative Dates ... 48
- Time ... 49

5 Audit Trail ... 49

6 Windows Login ... 51

7 Auto-Update ... 51

Part IV Main Application 56

1 Application Characteristics ... 56
- Quick Access Toolbar ... 56
- Menu System ... 57
  - File Menu ... 57
  - Dashboard Ribbon ... 58

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View Ribbon ... 59
Setup Ribbon ... 61
BioSolids Ribbon ... 62
Tools Ribbon ... 63
Support Ribbon ... 65
Help Ribbon ... 66
Operator10 Options ... 67
2 Database ... 68
Add New Database ... 69
Add New Facility ... 71
Delete Database ... 72
Delete Facility ... 72
Database Structure ... 73
Database Properties ... 75
Database Utilities ... 79
Database Utilities - Rename ... 79
Database Utilities - Table properties ... 80
Database Utilities - Rebuild ... 80
Database Utilities - Registry ... 81
Pervasive ... 82
3 Facility ... 83
4 Location ... 84
Add Location ... 86
Delete Location ... 87
Standard Location ... 87
5 Parameter ... 88
Add Parameter ... 90
Delete Parameter ... 91
Stock Parameters ... 91
6 Location:Parameter ... 92
Add Location:Parameter ... 95
Delete Location:Parameter ... 96
Location:Parameter Usage ... 96
7 Data ... 98
Add Data ... 98
Review Data ... 99
Data Types ... 100
Alpha Code ... 100
Data Value ... 100
Date ... 101
Greater Than ... 101
Less Than ... 101
Non-Detect ... 101
Time ... 102
8 Process Control ... 102
Process Setup ... 104
Process Section History ... 106
Create Process Calculations ... 107
9 Formula ... 108
Add Formula ... 109
Delete Formula ... 111

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Formula List ... 112
Internal Formulas ... 113
10 Alpha Codes ... 116
11 Chemicals ... 118
12 Barcode Labels ... 119
Barcode Template Name ... 121
13 Calculations ... 121
Averages ... 123
4-Day Average ... 123
7-Day Average ... 124
Average (Mean) ... 125
Flow-Weighted Average ... 125
Geometric Mean ... 126
Rounding Rules ... 126
Standard Deviation ... 127
14 Logged Documents ... 127
Log Document ... 129
Logged Documents - All ... 129
Logged Documents - DataView ... 131
Logged Documents - Report ... 132
Logged Documents - Graph ... 133
Part V BioSolids 136
1 BioSolids List ... 136
2 BioSolids Sites ... 139
Site Detail ... 142
3 Site Owner ... 144
4 Site Limits ... 145
5 Nutrient List ... 148
6 BioSolids Application ... 149
User Values ... 151
7 Available Nitrogen ... 151
Part VI Dashboard 153
1 Views ... 153
Create New View ... 153
View Name ... 154
View List ... 154
Pages ... 154
Add Page ... 155
Page Options and Features ... 155
HotSpots ... 155
Add Container ... 157
Containers ... 157
Data Containers ... 157
Graph Containers ... 159
Gauge Containers ... 161
Naviagtion Containers ... 163
Container Size ... 164

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Page Options 165

Part VII DataView 168

1 DataView List 169
2 Add DataView 170
3 DataView Name 171
4 Delete DataView 171
5 DataView Data Entry 172
6 DataView Columns 172
7 DataView Types 173
- Daily Values DataView 173
- Hourly Values DataView 174
- Summary Values DataView 175

8 DataView Properties 177
- DataView Properties - Display 177
- DataView Properties - Column Setup 180
- DataView Properties - Column Properties 182
- DataView Properties - Print Properties 184
  - DataView Print Properties - Options 184
  - DataView Print Properties - Page 185
  - DataView Print Properties - Margin 187
  - DataView Print Properties - Header/Footer 188

9 DataView Application 189
- DataView - File Menu 190
- DataView - Home Ribbon 191
- DataView - Edit Ribbon 193
- DataView - Tools Ribbon 195
- DataView - Window Ribbon 196
- Keyboard Shortcuts 196

10 DataView Features 197
- Group Headers 198
- Column Headers 198
- DataView Column Icons 199
- Find Data 201
- Quick Notes 202
- Import Data 204
- Export Data 205
- Freeze Columns 207
- Right-Click 207
- Block Summary 209
- Date Format Options 210

11 eDV (Electronic DataView) 211
- eDV Viewer 211
- Working with eDV 213
  - eDV Templates 214

Part VIII Graphing 217

1 Graph List 218
2 Graph Data 218

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Data Source ... **218**
Open Graph Date Range ... **220**
Calendar ... 220
3 Graph Options ... **221**
Graph Type ... **221**
Linear Regression ... **222**
Graph Data Type ... **222**
Graph Tools ... **222**
Balloons ... **222**
4 Main Window ... **223**
Menus ... **223**
File menu ... 223
Facility ... 223
Open Graph ... 224
New Graph ... 224
Close ... 224
Save/Save As ... 224
Print ... 225
Graph menu ... 225
Data Source ... 226
Constants Editor ... 226
Limits Editor ... 227
Refresh ... 227
Graph Properties ... 228
General Properties ... 228
Series Properties ... 228
Scale Propeties ... 229
3D View Properties ... 229
Titles ... 230
Copy Options ... 230
Automatic Scale ... 231
Fonts ... 231
Legends menu ... 232
Legend Box Size ... 234
X Legend Gap ... 234
Window menu ... 235
Data Window ... 235
Zoom ... 236
Palette Bar ... 237
Pattern Bar ... 237
Help menu ... 237
About ... 237
Toolbars ... **237**
Main Toolbar ... 238
Part IX Reporting **240**
1 Report Direct Access Tree ... **240**
2 Report Picklist ... **242**
3 Create Reports ... **242**
Add Report ... **242**
New Report Availability ... **244**
Report Name ... **245**

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4 Report Properties 245
Report Calculations 246
List and Label Report Designer 247
Report Guidance Documents 250
5 Report Folder 250
Report Folder Icons 251
6 Report Preparation 251
Print Report 252
Print Date 253
Print Preview 253
Report Date 255
Calendar 256
Logged Documents 256
Report Verify 257
7 Report Types 258
Custom Reports 259
Custom Report (Full) 259
Custom Report (From DV) 259
Custom Report Setup 260
General Properties 260
General Information 262
Report Data 263
User Input 265
Comments 267
Annual Summary Reports 268
5 Year Forecast Report 268
5 Year Forecast Setup 268
General Properties 269
Parameter and Calculations 271
Additional Parameter 272
PE/EDU and Industry Projections 273
Comments 274
Multi-Year Summary Report 275
Multi-Year Summary Setup 275
General Properties 276
Parameters 277
Summary Columns 279
Comments 280
Mass Balance Reports 281
Mass Balance Report Setup 281
General Properties 282
General Information 284
Rows 285
Comments 286
Limit Report 287
Limit Report Setup 287
General Properties 287
General Information 289
Limits 290
Comments 292
Weekly Summary Report 292
Weekly Report Setup 293
General Properties 293

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General Information ... 295
Parameters ... 296
Comments ... 297
Federal DMR Report ... 298
Federal DMR Setup ... 298
General Properties ... 299
General Information ... 301
Rows ... 302
Parameter ... 303
Loading ... 304
Concentration ... 306
Units ... 307
Frequency/Sample Type ... 308
Reporting ... 309
Comments ... 310
BioSolids Reports ... 311
BioSolids Application List Report ... 311
BioSolids Application List - General Properties ... 311
BioSolids Application List - General Information ... 314
BioSolids Application List - Comments ... 315
BioSolids Nutrient Report ... 316
BioSolids Nutrient Report - General Properties ... 316
BioSolids Nutrient Report - General Information ... 318
BioSolids Nutrient Report - Sites ... 319
BioSolids Nutrient Report - Report Inclusions ... 320
BioSolids Nutrient Report - Comments ... 321
BioSolids Limit Report ... 322
BioSolids Limit Report - General Properties ... 322
BioSolids Limit Report - General Information ... 324
BioSolids Limit Report - Sites ... 325
BioSolids Limit Report - Report Inclusions ... 326
BioSolids Limit Report - Comments ... 327

8 About ... 328

Part X Sampling Events 330

1 Sampling Event Detail ... 331
2 Add Sampling Event ... 333
3 Delete Sampling Event ... 334
4 Print Sampling Event ... 335

Part XI Notes 337

Part XII Interfaces 340

1 OPC/DDE Interface ... 340
OPC/DDE Interface Overview ... 341
OPC/DDE Main Window ... 342
OPC/DDE Link List ... 342
OPC/DDE Add/Remove/Print/Setup/Log ... 342
OPC/DDE Start & Stop ... 343
OPC/DDE Links ... 343
OPC/DDE Link Name ... 344

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OPC/DDE Link AllMax Definition ... 344
OPC/DDE Link Server Definition ... 345
OPC/DDE Link Schedule Definition ... 346
OPC/DDE Link Examples ... 347
OPC/DDE Functionality ... 348
OPC/DDE Setup ... 348
OPC/DDE Log ... 350
OPC/DDE Error Codes ... 350
DDE Server Functionality ... 351
NetDDE ... 353

Part XIII DataPort 355

1 DataPort Sync - Select L:Ps ... 355
2 DataPort Setup ... 356
3 AllMax Folder Software ... 356
Installation ... 357
Main Window ... 358
Menu Bar ... 358
Preferences ... 358
Security ... 359
4 Operator10 DataPort Software ... 359
About ... 361
Calendar ... 361
Graffiti Help ... 362
HotSync ... 364
Installation ... 364
Keypad ... 366
Main Window ... 366
Menu Bar ... 367
Note ... 368
Picklist ... 368
Preferences ... 369
Remove Record ... 370
Review Data ... 370
Scanner ... 371
Shortcuts ... 372
Time ... 372
Tips ... 373
Edit Commands ... 373

Part XIV Functions 375

1 All Functions (by groups) ... 375
2 All Functions (alphabetically) ... 380
3 General Information ... 386
Data Types ... 386
LP(l,p); [l:p] (Location:Parameter ... 387
4 Boolean Functions ... 389
AND(x,y) ... 389
BIT(x,y) ... 390
EQUAL(x,y) ... 390
GT(x,y) ... 390

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IF(x,y,z) ... 390
ISALPHA([l:p],x) ... 391
ISBLANK(x) ... 391
ISDATA(x) ... 391
ISDATE([l:p],x) ... 392
ISFECAL([l:p]) ... 392
ISFLOW([l:p]) ... 392
ISGREAT([l:p],x) ... 392
ISHR([l:p]) ... 393
ISLESS([l:p]) ... 393
ISLP([l:p]) ... 393
ISND([l:p],x) ... 394
ISTIME([l:p],x) ... 394
LT(x,y) ... 394
NOT(x) ... 394
OR(x,y) ... 395
XOR(x,y) ... 395

5 Constants ... 395

Constants ... 395
BLANK(x) ... 396
VAR0-9 ... 396

6 Daily Data Functions ... 397

D_AVG([l:p],x,y) ... 398
D_COMP([l:p],x,y) ... 398
D_COUNT([l:p],x,y) ... 398
D_FLOW([l:p],x,y) ... 399
D_FWA([l:p],x) ... 399
D_GAUGE([l:p],[l:p],x,y) ... 399
D_GMEAN([l:p],x,y) ... 400
D_IGAUGE([l:p],[l:p],x,y) ... 400
D_IMTR([l:p],x,y,z) ... 401
D_INTER([l:p],x) ... 401
D_LAST([l:p],x,y) ... 402
D_LASTN([l:p],x,y,z) ... 402
D_LASTNM([l:p],x,y,z) ... 402
D_LASTNN([l:p],x,y,z) ... 403
D_LASTNP([l:p],x,y,z,w) ... 403
D_LOADING([l:p],x,y) ... 404
D_MAX([l:p],x,y) ... 404
D_METER([l:p],x,y,z) ... 405
D_MIN([l:p],x,y) ... 405
D_NEXT([l:p],x,y) ... 405
D_STAT([l:p],[l:p],x,y,z) ... 406
D_STDEV([l:p],x,y) ... 407
D_SUM([l:p],x,y) ... 408
D_TOTAL([l:p],x,y) ... 408
D_VAL([l:p],x,y) ... 408

7 Date Functions ... 409

DATE([]j][m,d,y]) ... 409
DATE([j,x][m,d,y,x]) ... 410
DOM(x) ... 410
DOW(x) ... 410
DOY(x) ... 411

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DVAL(j,x) 411
LOM(x) 411
LOY(x) 411
M_DATE(x,y,z) 412
MOY(x) 412
WDOM(x) 413
WOM(x) 413
YR(x) 413
8 Hourly Data Functions 413
H_AVG([l:p],x,y) 414
H_CALC([l:p],x,y,z) 415
H_COMB([l:p],[l:p],x,y) 416
H_COUNT([l:p],x,y) 416
H_FUNC([l:p],x,y,z) 417
H_GMEAN([l:p],x,y) 418
H_INTER([l:p],x,y) 418
H_MAX([l:p],x,y,z) 419
H_MED([l:p],x,y) 419
H_METER([l:p],x,y,z) 420
H_MIN([l:p],x,y,z) 421
H_PRTPWR([l:p],[l:p],x,y) 421
H_STD([l:p],x,y) 422
H_SUM([l:p],x,y) 423
H_VAL([l:p],x,y) 423
9 Mathematical Functions 424
ABS(x) 425
ADD(x,y); x+y 425
AVG(x1,x2,...,xn) 425
COUNT(x1,x2,...xn) 425
DEFAULT(x,y) 426
DIST(x) 426
DIV(x,y); x/y 426
EXP(x) 426
FACT(x) 427
FIRST(x1,x2,...,xn) 427
FRAC(x) 427
IDIST(x) 427
INT(x) 428
INTER(a,c,fa,fc,b) 428
INV(x) 428
LIMIT(x,y,z) 428
LN(x) 429
LOG(x) 429
LOG_REM(x,y) 429
MAX(x1,x2,...,xn) 430
MIN(x1,x2,...,xn) 430
MOD(x,y); x%y 430
MUL(x,y); x*y 430
NONBLANK(x) 431
NONZERO(x) 431
PCT_REM(x,y) 431
PREC(x,y) 431
PWR(x,y); x^y 432

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RAND(x) ... 432
ROUND(x,y) ... 432
ROUNDE(x,y) ... 433
SQRT(x) ... 433
SUB(x,y); x-y ... 433
SUM(x1,x2,...,xn) ... 434
TRUNC(x,y) ... 434
VERIFY(x,y,z) ... 434

10 Miscellaneous Functions ... 434

ACCRUE([l:p],x) ... 435
ACODE([l:p],x) ... 436
ALPHA(ab) ... 436
APPLY(x,y) ... 436
ASSIGN([l:p],x,y) ... 437
BIN(x) ... 438
BLANK(x) ... 438
CT(x,y,z,w) ... 438
CTI(x,y,z,w) ... 439
CTR(x,y,z,w) ... 440
CVT(a:b,x) ... 440
CYL(x,y) ... 442
FAC(abc,x) ... 443
FORMULA(abc) ... 443
HEX(x) ... 443
HLIME(x,y,z,w,v) ... 444
INCLUDE(fn,[l:p],x,y,z) ... 444
LI(x,y,z,w,v,n1,n2) ... 445
LOOK(x,y1,y2,...,yn) ... 446
NOTE(abc,x) ... 446
ONCE(x,y) ... 446
ONCEW(x,y) ... 447
OPTION(x,y,z,w) ... 447
PRE_LMT([l:p],x) ... 448
QLIME(x,y,z,w,v) ... 448
RANGE(x1,y1,y2,...,yn) ... 449
SETF(x,y) ... 449
SETVAR(x) ... 449
SODA(x) ... 450
SYNC(abc) ... 450
TYPE(x,y) ... 451
VAL(abc) ... 451
WEIR(x,y,z) ... 452

11 Monthly Data Functions ... 452

M_AVG([l:p],x,y,z,w) ... 453
M_COMP([l:p],x,y) ... 454
M_COUNT([l:p],x) ... 454
M_COUNTH([l:p],x) ... 455
M_DATE(x,y,z) ... 455
M_GMEAN([l:p],x) ... 456
M_MAX([l:p],x,y,z,w) ... 456
M_MED([l:p],x,y,z) ... 457
M_MIN([l:p],x,y,z,w) ... 458
M_NTH([l:p],x,y,z,n) ... 459

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M_PCT([l:p],x,y,w,p) ... 460
M_REM([l:p],x,y) ... 461
M_STAT([l:p],[l:p],x,y) ... 462
M_STDEV([l:p],x) ... 464
M_SUM([l:p],x) ... 464
M_SUM2([l:p],x,y,z,w) ... 465
M_SUMH([l:p],x) ... 466
M_TOTAL([l:p],x) ... 466
M_TYPE([l:p],x,y) ... 466
12 OPC/DDE Functions ... 467
DDE(a|b!c,x) ... 467
DDE_P(a|b!c,x,y) ... 468
DDE_X(a|b!c,x) ... 469
OPC([a],b,c,x) ... 469
OPC_W([a],b,c,x,y) ... 470
13 Process Section Data Functions ... 471
ACCUM([l:p],x,y) ... 471
S_AVG([l:p],x) ... 472
S_SUM([l:p],x) ... 472
14 Quaterly Data Functions ... 472
Q_CSUM([l:p],x) ... 472
Q_SUM([l:p],x) ... 473
15 Trigonometry Functions ... 473
ACOS(x) ... 473
ASIN(x) ... 474
ATAN(x) ... 474
COS(x) ... 474
CSC(x) ... 474
SEC(x) ... 475
SIN(x) ... 475
TAN(x) ... 475
16 Violation Data Functions ... 475
E_SUM([l:p],x,y,z,w,v) ... 476
V_AVG([l:p],x,y,z,w,v) ... 477
V_CNT([l:p],x,y,z,w) ... 478
V_CNTP([l:p],x,y,z,w) ... 480
V_DLY([l:p],x,y,z,w) ... 481
V_DLYM([l:p],x,y,z,w) ... 481
V_MAV([l:p],x,y,z,w,v) ... 482
V_MAX([l:p],x,y,z,w,v) ... 484
V_MIN([l:p],x,y,z,w,v) ... 485
SNC_CJP([l:p],x,y,z,w,v1,v2) ... 486
SNC_MAXD([l:p],x,y,z,w,v) ... 487
SNC_MAXM([l:p],x,y,z,w,v) ... 489
SNC_MIND([l:p],x,y,z,w,v) ... 490
SNC_MINM([l:p],x,y,z,w,v) ... 491
17 Weekly Data Functions ... 492
W_AVG([l:p],x,y,z,w) ... 492
W_MAX([l:p],x,y,z,w) ... 493
W_MIN([l:p],x,y,z,w) ... 495
18 Yearly Data Functions ... 496
Y_AVG([l:p],x,y,z) ... 496

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Y_AVGM([l:p],x,y,z) ... 497
Y_CAVG([l:p],x,y,z) ... 497
Y_COUNT([l:p],x,y,z) ... 498
Y_CSUM([l:p],x) ... 498
Y_MAX([l:p],x,y) ... 498
Y_MAXM([l:p],x,y,z) ... 499
Y_MIN([l:p],x,y) ... 499
Y_MINM([l:p],x,y,z) ... 500
Y_RES([l:p],x,y1,y2,y3,y4) ... 500
Y_SUM([l:p],x,y) ... 500
Y_TOTM([l:p],x,y) ... 501

Part XV Utilities 503

1 Database Backup ... 503
2 Import/Export Facility ... 504
3 Operator10 Agent ... 505
Calculation Schedule ... 509
4 Calculate Utility ... 509
5 Locked Data ... 510
6 Import Utility ... 511
Import Sampling Events Data ... 515
7 Export Data Utility ... 518
8 Calculator Tool ... 518
9 Operator10 Tools ... 519

Index 521

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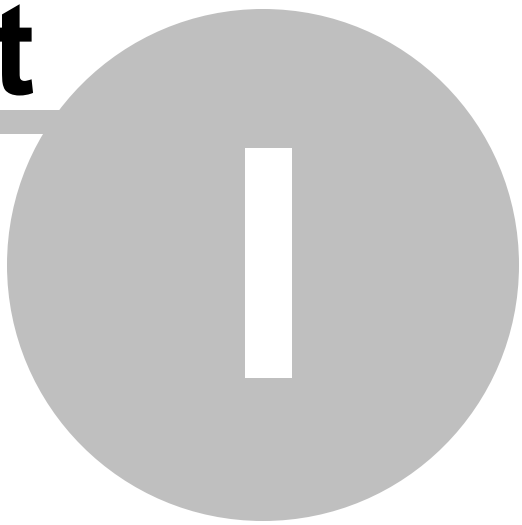
Part



1 Welcome to Operator10 - Wastewater

Operator10 - Wastewater is a full-featured data management application designed to help meet the data collection and reporting needs for the Water and Wastewater Treatment industries. Operator10 - Wastewater allows users to manage data that has been manually entered, calculated (via internal formula or user-defined formula) or collected from an alternate data source, such as LIMS, SCADA, data import and/or DataPort.

Unique Location:Parameter data points provide the means by which data is stored and shown throughout the application. Unlimited Location:Parameters can be created to define regulatory reporting data, process control data and other internal data points.

DataViews, custom defined collections of Location:Parameter data, serve as tools to enter and review available data. The Graphing section allows users to produce unlimited full-color, 2-dimension and 3-dimension charts capable of displaying raw and summarized data for user-defined multi-day, -month or -year periods. Stock regulatory and custom reports are able to be created and managed for previewing and printing as well as electronic data export.

This help file is designed to help users, new and experienced alike, and provide a valuable reference to the tools and features available in Operator10 - Wastewater.

Getting Started - General Application Characteristics

Review the following topics to learn more!

- Getting Started
- Ribbon Interface

Getting Started - Users Upgrading from version 9

- Main Application
- Dashboard
- DataView
- Operator10 Agent

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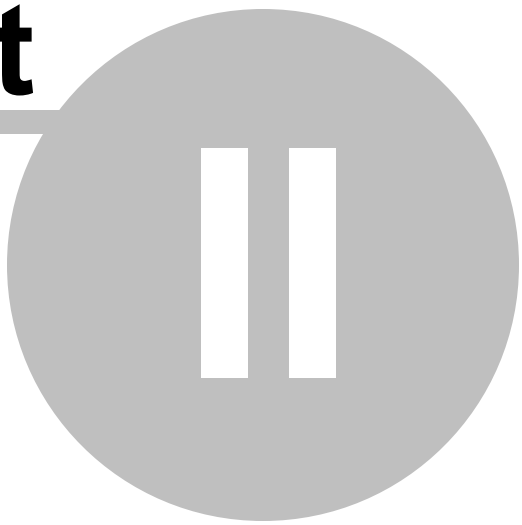
Part



2 Introduction to Operator10 - Wastewater

Topics in this section provide basic information related to the general usage of Operator10 - Wastewater.

In this section:

- Getting Started
- About Operator10 - Wastewater
- Support
- Help File Conventions
- Copyright

2.1 Getting Started

Topics in this section include:

- Installation Overview

2.1.1 Installation Overview

Important Installation Notes

If you are an existing user of Operator10 version 9.19, you will need to make note of the following important items:

- Prior to installation, perform a backup of all active databases maintained in version 9.19
- Install version 10.20 (see **Installation Guide** and **Installation Instructions**)
- Restore version 9.19 database(s) through the version 10.20 application upon initial use
- Upon restoration, databases will be updated to current version 10.20 structure

If you are a new user or installing Operator10 version 10.20 on computer or server which has not been used previously, you may skip to the Installation Guide or Installation Instructions topics.

Installation Guide

At the server/for stand-alone machines:

- Install Pervasive Database support (included on CD-ROM, only if necessary)
- Install Operator10 Application
- Run Application
- Update Database(s)

At the clients/workstations:

- Install Pervasive Database support (included on CD-ROM, only if necessary)
- Install Operator10 Application

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- Run Application

Installation Instructions

1. Insert the disk in the CD-ROM drive as provided by AllMax Software, Inc.
   - The Autorun feature should immediately begin the install process. Should Autorun not begin, explore the CD and run **Setup (App Name).exe**

> ***NOTE:*** Microsoft .Net Framework 3.5 SP1 is required. If absent, the installation will alert the user and abort. Download and install Microsoft.Net Framework 3.5 from the Microsoft website. (http://www.microsoft.com/en-us/download/details.aspx?id=22)

> ***NOTE:*** Microsoft Visual C++2008 SP1 is required and included on this installation media, if necessary, the installation for this will be performed automatically.

> ***NOTE:*** If the software has already been installed on the computer, you will be presented with the option to upgrade the application. Click Yes to proceed.

2. To view the installation instructions, click **Instructions** or click **Next >**
3. Please read and select an option for acceptance of the End User License Agreement. Click **Next**.
4. Enter the AllMax Software key code. Click **Next**.
5. Select the role of the computer
   - **( ) This computer will store and serve data to others** – Choose this option if the computer is the server, a computer acting as a server or a stand-alone computer. Click **Next**
   - **( ) This computer will access data that is server by another computer** – Choose this option if the computer is going to connect to a server or serving computer on the network as a client or workstation. Click **Next**

> ***NOTE:*** If necessary, Pervasive PSQL Database engine support will be installed. This is a separate installation program and will proceed independently from the AllMax Software installation.

6. Select the Destination Folder to which the application will be installed. To change, click **Change...**. Click **Next** to continue.

> ***NOTE:*** The default directory provided is intended for new installations and is not suitable for existing users of version 9.19. The directory/path MUST be modified in order to allow the installation to proceed. Click the Change… button to select a new path or enter a new path to be used.
>
> **Suggested paths:** C:\AllMax Software\Wastewater\

> ***NOTE:*** If the computer serves data, the selected directory MUST be shared or part of an existing share available to network users. If the selected directory is

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not shared, the installation will alert the user and allow the user to perform the necessary actions to share the folder through Windows or proceed if the share is not necessary (in the case of a stand-alone computer).

7. Click **Install** to begin the installation.

NOTE: If necessary, the installation will begin the installation of the OPC foundation components.

8. Upon the completion of the installation, click **Finish**.

Pervasive Database Installation
If necessary, the installation will begin to install the Pervasive PSQL Database Engine. This is a separate installation procedure from the operations software application. Following the successful installation, the software install will continue.

- Click **Next** to begin the installation.
  - Choose the "**I accept...**" option to accept the Pervasive End User License Agreement (EULA). Click **Next**.
  - To enable the most flexibility, AllMax recommends installing the Pervasive Engine as a Windows Service. Select **[ ] Run as Service**. Click **Next**.
  - Choose the **[ ] Complete** option to continue with the installation. Click **Next**.
  - The installation will now begin. During the installation, any old Pervasive version will be identified and removed or archived.
  - Following the installation, the option to activate the Pervasive software will appear. Choose **[ ] Activate Now** to activate if you have a Pervasive license as supplied to you by AllMax Software. If you do not have the key code, a demo license will be installed and will be active for a 30-day period. Click **Next**.
  - Enter the Pervasive key code as provided and click **Next**.
  - Upon successful activation, the installation will be complete. Click **Finish** to return to the AllMax Software installation.

Updates
Follow these instructions to setup, install, and apply program updates to existing installations of the AllMax operations programs. Updates are normally provided through a web download, for both the Server and Client installation.

1. Download the file from the AllMax Software web site (http://www.allmaxsoftware.com/downloads/) to the machine that you wish to apply the update.
2. Locate the downloaded update file and run by double-clicking.
3. Click **Next** to proceed with the update process.
4. Upon completion and upon opening the application for the first time, the database may need to be updated to the latest version. A prompt will be provided when the AllMax program is opened. Follow the prompts provided to complete.
5. Updates will need to be applied to all computers using the AllMax programs.

Support Information
For more information on additional installation options or help with the installation process, please contact AllMax Software technical support at 800-670-1867, or

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go2tech@allmaxsoftware.com, or online using our go2tech remote technical support tool.

2.2 About Operator10 - Wastewater

Topics in this section discuss the following features and functionality:

In this section:

- License
- Help | About
- System Properties
- Credits

2.2.1 License

License Information

AllMax provides a separate License for each copy or installation of the Operator10 - Wastewater software. It controls access to Number of Concurrent Users, Versions, Demo Mode, etc.

> ***Warning***: You MUST have a separate License for each copy or installation of the Operator10 - Wastewater software. Contact AllMax for additional information.

If you are licensed with Multi-User capabilities, this will allow you to load the software onto a computer network. Multi-user **does not** allow for installation of the program onto computers at different sites.

License Database

A license database is created during the installation process or as needed with AllMax Software, Inc. Technical Support staff. The license database holds secure information related to the number of seats purchased, features enabled and support dates. Licenses can be updated via a new keycode, supplied by AllMax Software, Inc.

Seats

Operator10 - Wastewater is licensed using a seat-based structure which stipulates that a client who has purchased Operator10 - Wastewater may install Operator10 - Wastewater on a total number of computers/workstations/clients as not to exceed your total license seat count.

For example, a user who has purchased a 5-user, multi-user version of Operator10 - Wastewater is permitted to install the Operator10 - Wastewater client application on up to 5 individual workstations that are connected to a main server or serving computer. The seat count does not include the server, unless the server or serving computer will be used as a workstation where day-to-day usage of the software will occur.

2.2.1.1 Keycode

Keycode

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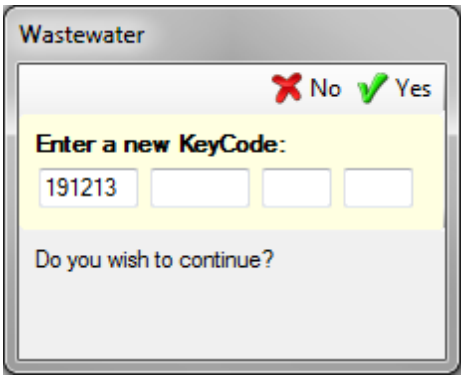
AllMax Software, Inc. provides a separate License for each copy or installation of the Operator10 - Wastewater software. It controls access to Number of Licensed Seats, Versions, Demo Mode, etc.

> ***Warning:*** You MUST have a separate License for each copy or installation of the Operator10 - Wastewater software. Contact AllMax Software, Inc. for additional information.

Licenses may be updated by entering the 20-digit KeyCode supplied by AllMax, either when prompted during the installation or at any time from the Help | About screen.



2.2.2 Configuration File

Configuration File

An application-wide Configuration File, OP10.cfg, is found in the database directory.

The configuration file is used to manage application settings and characteristics. Changes to the configuration file are not recommended and should only be made with the help of AllMax Software, Inc. technical support staff.

For more information, contact AllMax Software, Inc. using any of the following methods:

AllMax Software, Inc.
PO Box 40
911 S. Main St.
Kenton, OH 43326

Toll-free phone: 800-670-1867
Local phone: 419-673-8863
Fax:419-673-8864

Sales & account email address: sales@allmaxsoftware.com
Technical Support email address: go2tech@allmaxsoftware.com
Corporate website: www.allmaxsoftware.com
go2tech remote support website: www.allmaxsoftware.com/go2tech/

2.2.3 Help | About

Help | About Screen

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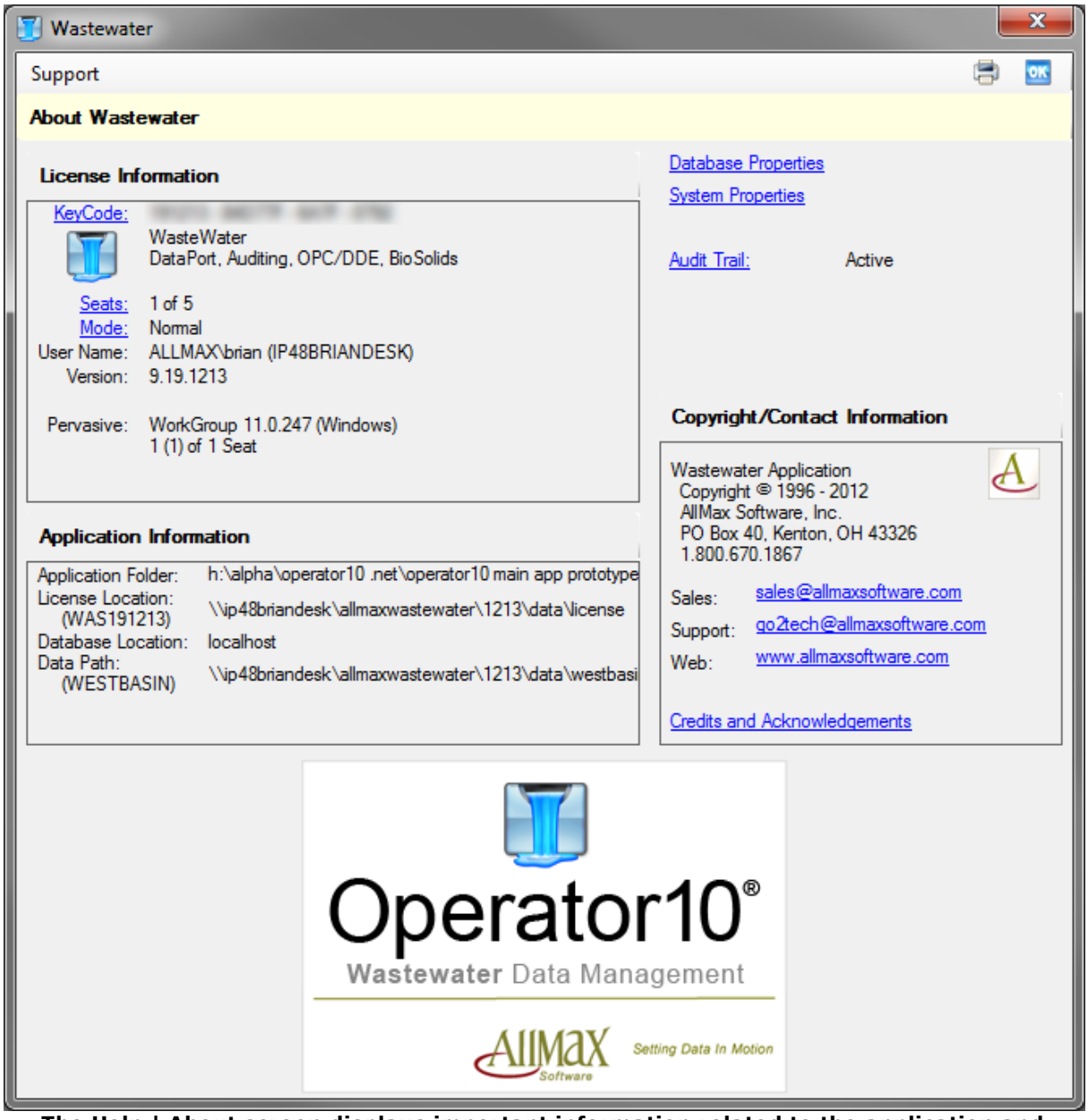
The **Help | About** screen displays important details related the application and database support that can aid and assist the user and technical support in resolving technical support issues.

To access the Help | About screen, navigate to the **Help** menu and choose the option **About**.



The Help | About screen displays important information related to the application and database support for Operator10 - Wastewater.

Information presented in the Help | About screen includes but is not limited to the following sections.

NOTE: Information presented in the Help | About screen that appears in blue,

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underlined text, similar to a link, allows for users to click and perform an available action.

Example: Clicking KeyCode: will bring up the KeyCode entry form.

License Information

The information presented in the License Information section includes, but is not limited to:

- **Keycode**: This is the current keycode associated with the Operator10 - Wastewater license in use. To update the keycode, click the Keycode label and enter the provided KeyCode. For more information, see the Keycode Help Topic.
- **Seats**: Displays the recent count of the number of seats used to access the license and the total number of licensed seats available based on current licensing. Click the Seats label to view a lists of seats recently used to access the license.
- **Username**: Displays the current user logged into Operator10 - Wastewater. For more information on Users, please see the User Security topic.
- **Version**: Displays the version number of the application. The version number is displayed in the following format - Version #.Release #.Revision # (ex: 10.20.0123) - and is updated periodically as new versions, releases or updates are provided.

Application Information

The information present in the Application Information section includes, but is not limited to:

- **Application Folder**: Displays the path to the directory/folder where Operator10 - Wastewater is currently being run from.
- **Conduit Location**: Displays the machine name that the client application (main application) is using to communicate with the Operator10 - Wastewater database.
- **License Location**: Displays the machine name (and license database name) where the Operator10 - Wastewater license database is located.
- **Database Location**: Displays the machine name (and database name) where the Operator10 - Wastewater database is located.

Properties

Operator10 - Wastewater maintains multiple settings and properties that apply to the database and application. Depending on user security settings, users may be able to work with these settings and modify database and application characteristics.

Click on the available link options to make changes (when applicable).

- **Database Properties**: Click this link to work with database-level properties. For more information, see the Database Properties help topic.
- **System Properties**: Click this link to view information about the current machine or system settings. For more information, see the System Properties help topic.

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Copyright/Contact Information

The Copyright/Contact Information section displays contact information for AllMax Software, Inc. as well as a Credits and Acknowledgements section. For more information, see the Credits help topic.

2.2.4 System Properties

The System Properties window displays the basic information related to the computer or system running the Operator10 - Wastewater application.

Information here is for display only and typically only necessary during technical support calls. Details provided on this screen include, but are not limited to:

- Microsoft Windows version
- Microsoft .Net version
- Memory (RAM)
- Hardware information
- Processor information
- Disk space (available and total)

2.2.5 Credits

Credits and technologies in use include:

ComponentOne TrueDBGrid v2.0.20121.61252 (CLR 2.0)

List & Label® v13.8 (ListLabel13.dll v13.6.0.18936)
©1992 - 2008 combit® GmbH

Ionic DotNetZip Library v1.8.4.3.0

OPC Foundation Data Components v3.00.10102

Microsoft® .NET Framework 3.5 SP1

Microsoft® Visual C++ Runtime 2008 SP1

Palm Desktop v4.1.4

Pervasive® PSQL v11 (and v10) Database Engine

2.3 Support

Technical Support is available through AllMax Software, Inc. For more information, please see the available help topics.

- Support Menu
- Help | About
- Help File Conventions

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For more information or to renew support, please contact AllMax Software, Inc. at 800-670-1867 or by email at go2tech@allmaxsoftware.com.

2.3.1 Support Menu

Support Menu

The Support menu in the main application toolbar displays specific help and support options available to clients who have a current support contract and keycode with AllMax Software, Inc.

Options available in the Support menu include:

- **License #**: Displays the license number as provided by AllMax Software.
- **Update Information**: Displays the current release of the Operator10 - Wastewater software (Internet Connection required) and current status, 'Current' or 'Out of Date'.
- **File Versions**: Opens the Check Version Utility
- **go2tech**: (Internet Connection required) Begins a new session with AllMax Software Technical Support. View the go2tech topic to learn more.
- **Web Support**: (Internet Connection required) Takes users to support form on AllMax Software's website. Form information is sent directly to Technical Support Representatives.
- **Email Support**: (Internet Connection required) Initializes a new email message, addressed to AllMax Software Technical Support staff.
- **Error Log**:Provides a link to the error log of Operator10 - Wastewater.

2.4 Help File Conventions

Help Topic (action(s))
represents an entry in this help file by the name of "Help Topic" which may be activated in the application by performing the "action(s)" listed.

<keyname>
represents pressing the keyboard key marked as "keyname".

[button name]
represents pressing the dialog box pushbutton displaying the name "button name".

menu_item1 | menu_item2
represents choosing "menu item1" from the main menu, then choosing "menu item2" from the submenu.

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( ) radio_name
represents choosing the radio button displaying the name "radio name".

[ ] check_name
represents choosing the checkbox displaying the name "check name".

(n1 to n2 characters)
represents a text entry of from n1 to n2 characters, including spaces and punctuation. If n1 is 0, no entry is required. Reserved punctuation characters: hyphen, colon, and comma (- : ,) have special usage, and should not be used for most entries.

link
click links to navigate to additional topics or information.

hover over this style of link to display acronym information and definition.

2.5 Copyright

Operator10 - Wastewater Data Management Software for Water and Wastewater is © 1996-2014 by AllMax Software, Inc.

AllMax Software, Inc.
PO Box 40
911 S. Main St.
Kenton, OH 43326

Toll-free phone: 800-670-1867
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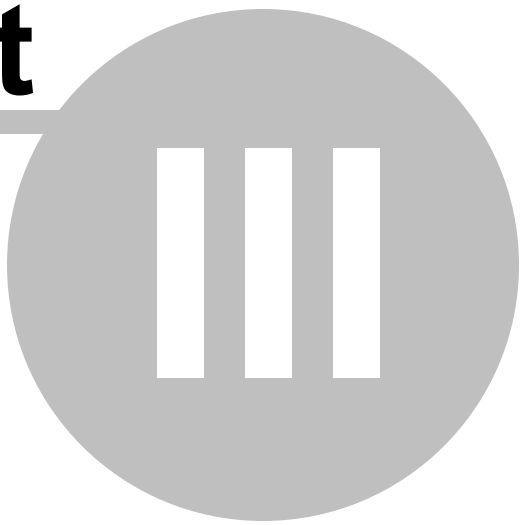
Technical Support email address: go2tech@allmaxsoftware.com
Corporate website: www.allmaxsoftware.com
go2tech remote support website: www.allmaxsoftware.com/go2tech/

Part



3 General Features

Topics in this section include:

- Grid
- Multi-Edit
- Security
- Date/Calendar
- Audit Trail
- Windows Login

3.1 Grid

Topics in this section include:

- Grid Toolbar
- Grid Columns
- Grid Data View
- Grid Print

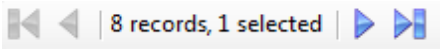
3.1.1 Grid Toolbar

Toolbar

The AllMax Grid Toolbar is available throughout the program and has many functions. Users can manipulate the information presented in the grid by using the available features. Depending on the section of the AllMax software program, some features and options may be enabled or disabled. For more information, please contact AllMax Technical Support Representatives for more information.

Navigation

Navigation through the records displayed in the grid can be controlled through the navigation portion of the toolbar.



In order, the buttons provide the following functionality:

[Move First] | [Move Previous] | Total Records, Record(s) Selected **| [Move Next] | [Move Last]**

Add

Users may create new records for most grids, when available the Add button will allow users to create new records as well as use additional functionality to create similar records or add special items when necessary.

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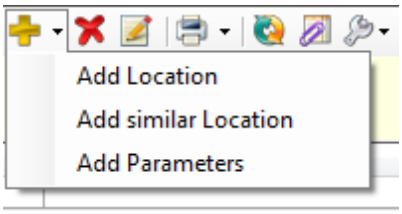

Add New

When adding new records, users may click **[Add]** the button directly, or click the arrow to the on the right-side to select from a menu, this will begin the process of adding a new record.

Add Similar

When applicable, users may click the arrow on the right side to select Add Similar from the menu, this will begin the process of adding a new record based on a selected record or selection of records.

Add Special

When available, users may click the arrow on the right side to select from a special option. This option is not present in all grids, but when available, will be a selection in the menu.

Delete

When available, records can be deleted from the grid. Users can select or multi-select records to be deleted from the available rows of the grid. Click the **[Delete]** button to remove. Users will be prompted to confirm the deletion of the selected record(s) to complete the delete process.

Edit

In-Grid Editing

To edit records contained in the grid, users can either enter text directly into blank cells or for cells with existing data, double-click the cell or press the F2 key and begin the edit process. Once editing is complete, navigate away from the selected cell using the Tab, Enter or Arrow keys to automatically save changes.

Edit Window

To edit records in a form-based editor, click the **[Edit]** button to display the Edit window to make changes. Click the **[Save]** button to save any changes made.

Multi-edit

For users who desire to change multiple records at a time, while multiple records have

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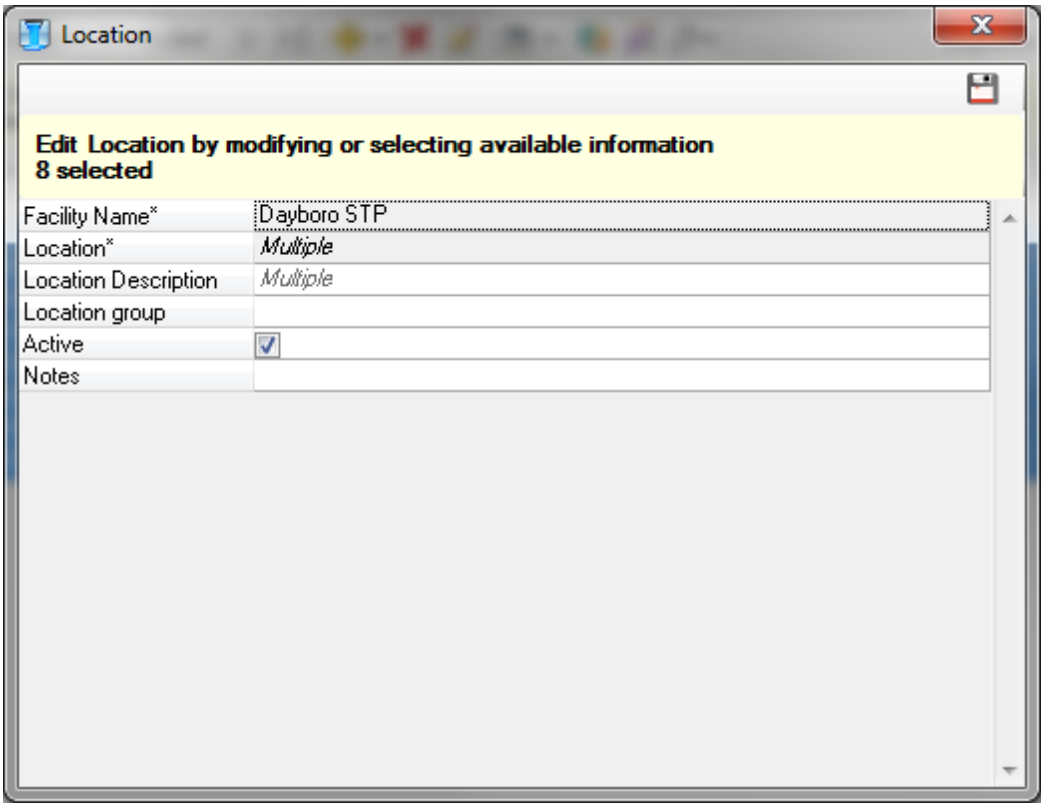
been selected in the grid, clicking the **[Edit]** button will allow users to change data for the selected record(s).

Any available fields for editing will shown in the **Edit** window. Additionally, the fields available for editing will vary depending on the section of the program.



Print

Data presented in the grids throughout Operator10 - Wastewater can be printed.

Several Print options exist. Click the **[Print]** button to review the printing options.

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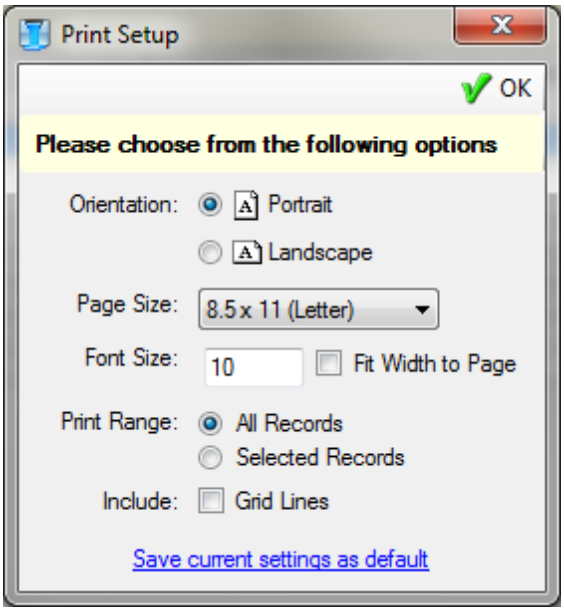

Orientation: Select from the options **( ) Portrait** or **( ) Landscape** to set the page orientation

Page Size: Select from Letter (8.5"x11"), Legal (8.5" x 14") or Tabloid (11"x14") to set the size of the page

Font Size: Select a font size to print grid contents

NOTE: By choosing the option **[ ] Fit Width to Page** the font size will automatically be calculated and used for printing

Print Range: Select from the options **( ) All Records** or **( ) Selected Records** to determine the number of records to be printed

Include: Select **[ ] Grid Lines** if you want to print the records with grid lines

Save current settings as default: Click this link if you wish to save the settings as a default to be used during the next print

NOTE: The settings are saved by user and by the individual print windows

Export Data

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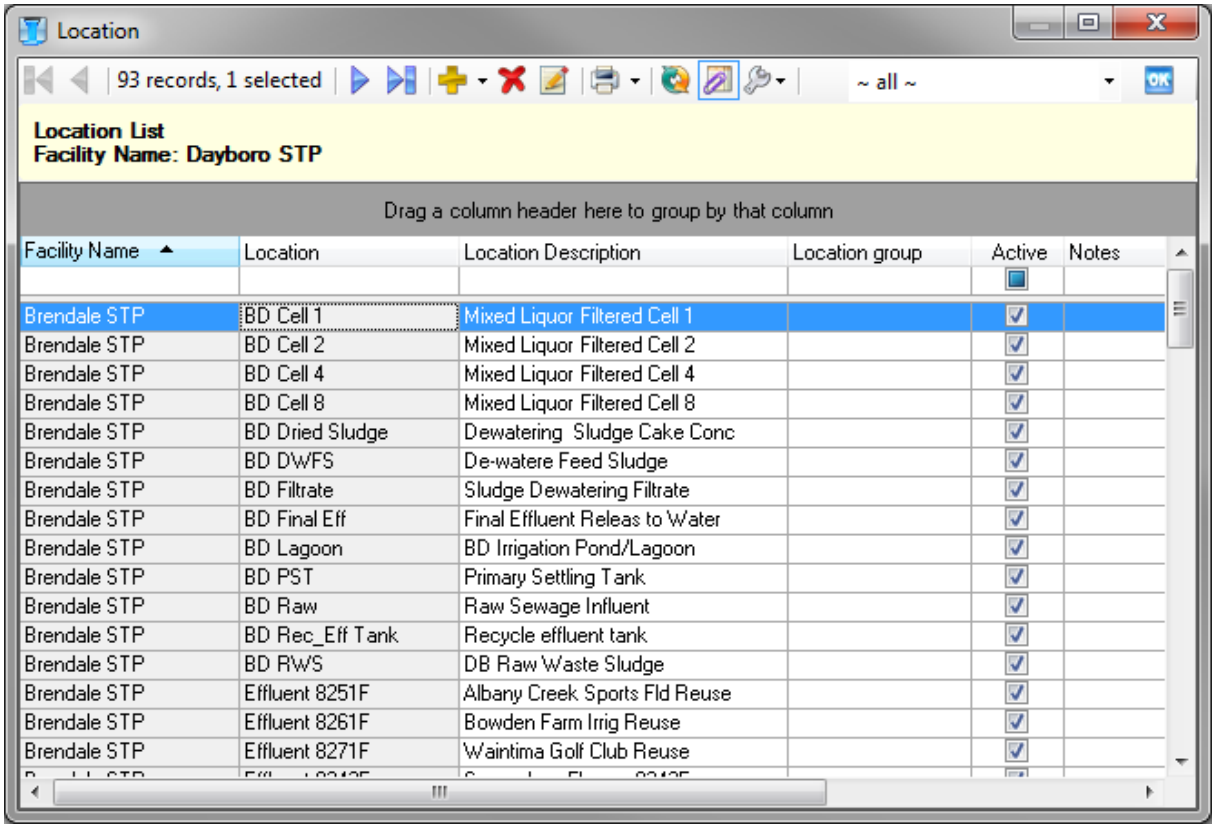
Users can export grid data as a .csv (comma-separated values) file. This export file will contain the columns displayed in the grid at the time of export. Users should click on the down arrow beside the **[Print]** button to select **Export** then select **Export grid as CSV.** Users will be able to give a file name and file location for the saved file in the next step.

Refresh

Grid contents can be refreshed as needed, press the **[F5]** key or the **[Refresh]** button in the toolbar to refresh the data from the database. This option re-queries the database to provide new and/or updated data.

Grouping

Grouping allows users to organize and re-organize data shown in grids. When users click the **[Grouping]** button, a darkened area will appear above the grid space (see image below). Users are instructed to "Drag a column header here to group by that column".


Location
93 records, 1 selected
~ all ~
Location List
Facility Name: Dayboro STP
Drag a column header here to group by that column

Facility Name	Location	Location Description	Location group	Active	Notes
Brendale STP	BD Cell 1	Mixed Liquor Filtered Cell 1		☑	
Brendale STP	BD Cell 2	Mixed Liquor Filtered Cell 2		☑	
Brendale STP	BD Cell 4	Mixed Liquor Filtered Cell 4		☑	
Brendale STP	BD Cell 8	Mixed Liquor Filtered Cell 8		☑	
Brendale STP	BD Dried Sludge	Dewatering Sludge Cake Conc		☑	
Brendale STP	BD DWFS	De-watere Feed Sludge		☑	
Brendale STP	BD Filtrate	Sludge Dewatering Filtrate		☑	
Brendale STP	BD Final Eff	Final Effluent Releas to Water		☑	
Brendale STP	BD Lagoon	BD Irrigation Pond/Lagoon		☑	
Brendale STP	BD PST	Primary Settling Tank		☑	
Brendale STP	BD Raw	Raw Sewage Influent		☑	
Brendale STP	BD Rec_Eff Tank	Recycle effluent tank		☑	
Brendale STP	BD RWS	DB Raw Waste Sludge		☑	
Brendale STP	Effluent 8251F	Albany Creek Sports Fld Reuse		☑	
Brendale STP	Effluent 8261F	Bowden Farm Irrig Reuse		☑	
Brendale STP	Effluent 8271F	Waintima Golf Club Reuse		☑	

To select a column, single-click and hold on the column header and drag the column header into the darkened space; release the mouse to group by the selected header. The records will reorganize using the selected column to group items together. Users will now see the information in the grid organized by grouped selection. By clicking the ⊞ button to the left of the information in the grid, users will be able to see the grouped information in the new grouped view. (see image below)

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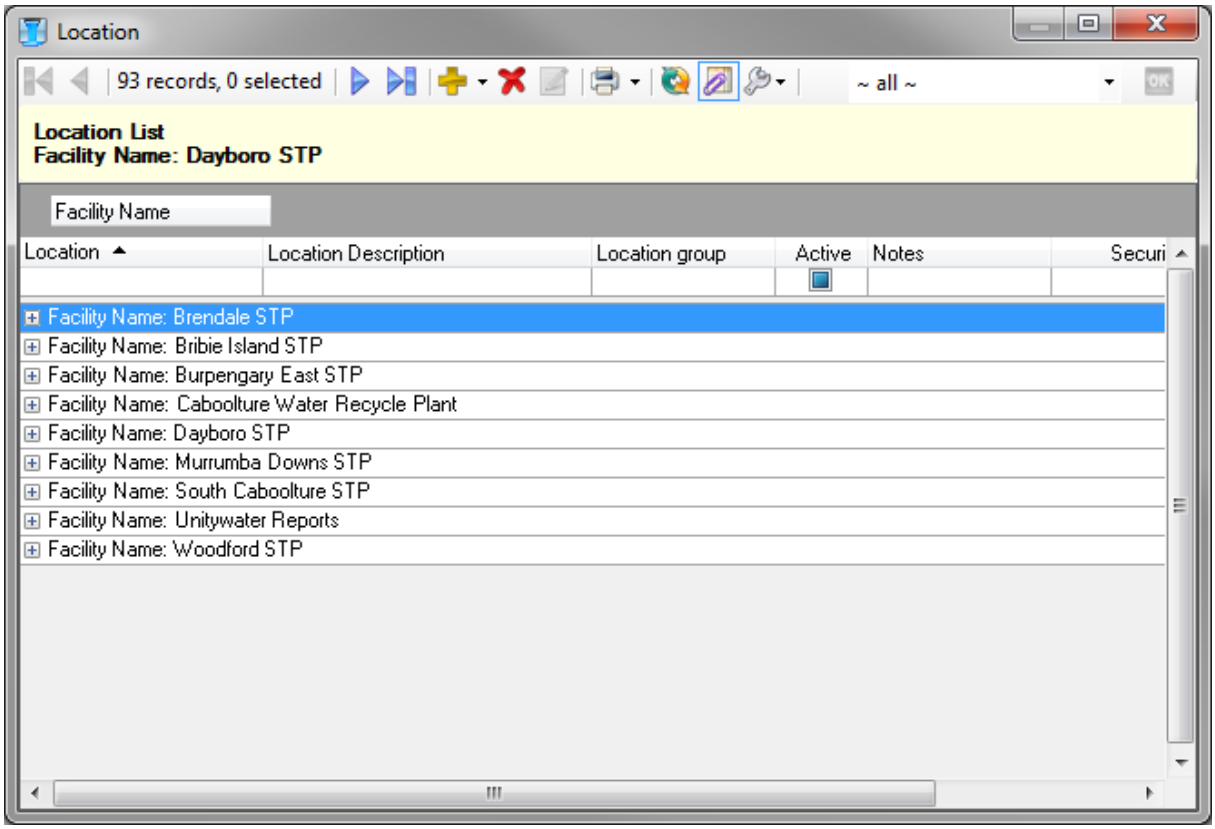


Multiple Groups

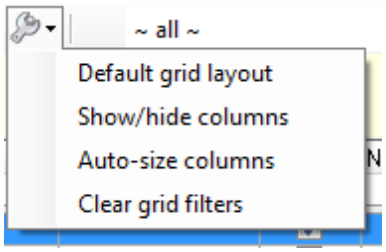
The picture shown above also demonstrates the ability for users to group by multiple columns. Simply drag another header into the grouping area to add a second group. Grouping is sequential and listed in order.

Remove Grouping

To remove grouping, click on the Grouping icon in the toolbar. This will remove the groups and replace all columns to their most recent grid position.

Tools

In the tools menu, users can find helpful features that will aid in the use of the grid and the data presented there. Press the **[Tools]** button to display the menu.



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Default grid layout:	Resets the grid and columns shown to the default Operator10 - Wastewater layout and content
Show/hide columns:	Shows the menu allowing users to show or hide available columns in the grid
Auto-size columns:	Resizes the columns to fit the data present in the grid
Clear grid filters:	Removes any applied grid filters

Picklist

In many areas, a picklist will be available to help filter and sort records based on Facility. Additionally, when a selection has been made in the picklist, future actions may use this selection to help you create new records and speed the entry process.

3.1.2 Grid Columns

Columns

The grids in Antero provide users more flexibility by allowing the inclusion or exclusion of columns from any grid. Additional column manipulation or usage is available from the following options. Review this following topic for details.

Show/Hide Columns

Columns can be shown or hidden based on a users preference. To show additional available columns, click on the **[Tools]** button in the Grid Toolbar and choose the option **Show/hide columns**. Columns available to be included or removed will be shown in the list provided. Place a check beside any column you wish to display. Remove the check from any column and the column will be removed. Columns added will be placed to the far right of the grid and can be moved to a desired position, see the topic for Drag/Drop Placement below for details.

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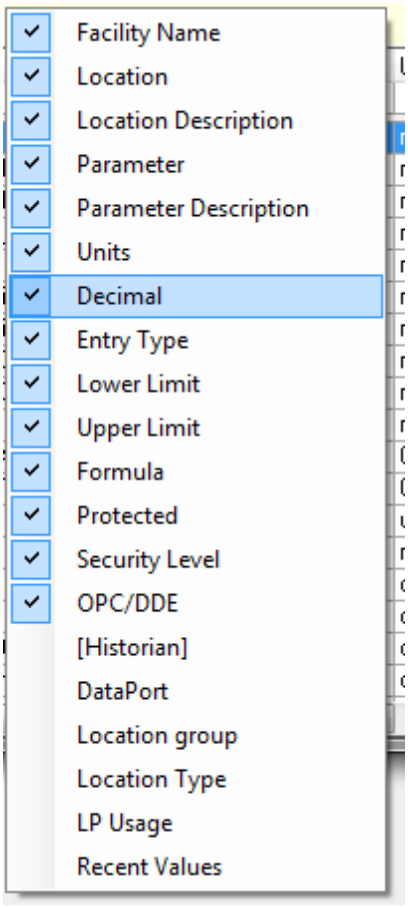

Columns can also be quickly removed by right-clicking on the column header and choosing **Hide Column** from the right-click menu.

Drag/Drop Placement

To re-order columns, left-click and hold on the column header to be moved. (Users should see the mouse pointer change to a solid, down arrow.) With the column selected, drag the column into the desired position. When the column is held in a position relative to its desired, new position, the user should see a solid, red up arrow. This indicates the new position of the column. To position the column, release the left-click mouse button, the column should now be in its new position. Users may reposition all columns if desired.

> ***NOTE:*** Column positions are saved for each user and are remembered for next use.

Freeze/Unfreeze/Unfreeze All

Freeze

Columns can be frozen to the left-side of the grid if desired. Right-click on the column to be frozen and choose the option **Freeze Column** from the right-click menu. The column will now be frozen to the left-side of the grid and the remaining

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columns will scroll while the frozen column is left always in view.

Multiple columns can be frozen, right-click on additional columns to be frozen and repeat the steps listed above.

> ***NOTE:*** Frozen columns are saved for each user and are remembered for next use.

Unfreeze

Columns can be unfrozen from the grid. Right-click on a frozen column in the grid and select **Unfreeze Column**. The column should become unfrozen and return to its original position in the grid.

> ***NOTE:*** Columns must be unfrozen from right-to-left. When freezing multiple columns, you cannot unfreeze the second column of three columns that have been frozen.

Unfreeze All

To quickly unfreeze all columns, right-click on any column header and select **Unfreeze All**. All columns frozen will be returned to their original positions in the grid.

Re-size/Auto-size

Column width can be defined and saved for each user. To re-size the column to a desired width, move the mouse pointer to the right-edge of the column header to be re-sized. The mouse pointer will change and display with arrows on both the left and right sides. Left-click and hold to begin resizing the column.

To automatically size the column to the data presented, click the **[Tools]** menu and choose the option **Auto-size** to automatically re-size the column to data.

Grouping

Grids can be grouped based on desired columns. Grouping can help to compact the data presented in the grid by grouping together like pieces of information. See the Grouping help topic for details.

Default Grid Layout

Grids can be reset to the default AllMax generated grid layout. This will reset all grid preferences including columns shown/hidden, size and content.

3.1.3 Grid Data View

Data

The grids in Operator10 - Wastewater allow users to see virtually every piece of data stored in the database. With this increase in data, comes the need for proper view options when working with the Operator10 - Wastewater data. Users can perform the following

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actions on data to ensure efficient usage and navigation throughout the application and database.

Sorting

Columns can be sorted in ascending or descending order. Left-click on the column header to sort in an ascending (A-Z) order. Left-click again sort in a descending (Z-A) order.

Filtering

Filters can be applied to one or more columns appearing in the grid.

Apply Filter

Direct Entry
To filter the column by entry, enter a search string into the blank field that appears above the column. Filtering begins immediately as the user enters data.

Selection
To filter the column by selection, click in the filter field to display the drop-down arrow, click the drop-down arrow to display a list of the unique items that appear in the grid column. Quick filters can be applied by selecting from the list.

Remove Filter

To remove an individual filter, select the option (All) from the selection list of the filter field.

To remove all filters, users may:

- Right-click on the filter area and choose the option **Clear all filters**
- Click the **[Tools]** button to display the Tools menu. From the Tools menu, choose the option **Clear grid filters.**

Grouping

Data that appears in each grid can be grouped based on selected columns. Grouped data provides a condensed view of records and allows users to see only the selected information. See the Grouping help topic for details.

Right-click Functionality

Right-click functionality in any grid is available throughout Operator10 - Wastewater. Users will find different right-click options exist depending on the area of the grid that is clicked on.

- **Filter Fields**: Right-clicking on the filter field will allow the user to remove any filters that have been applied to the grid contents.
- **Cells**: Right-clicking on any cell in the grid will display a right-click menu with common text commands, such as Cut, Copy, Paste and Delete. Additionally, when right-clicking on a field that is in someway linked to other sections of the program, users may find **Edit** options available. Selecting an **Edit** option will display the **Edit** window for the linked item.

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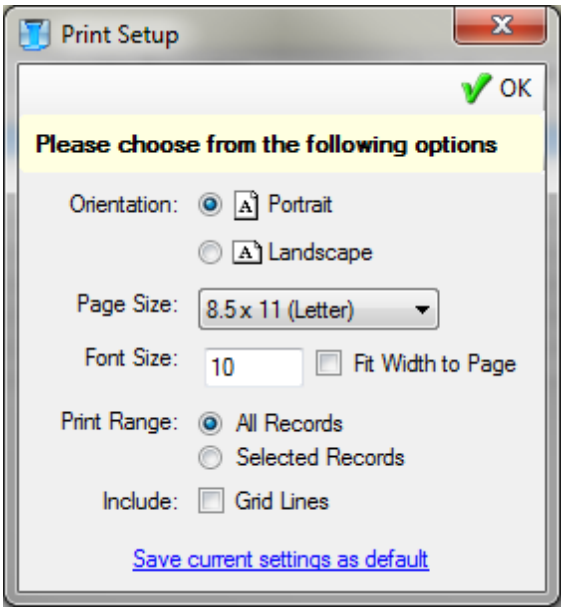
3.1.4 Grid Print

Print

Data presented in the grids throughout Operator10 - Wastewater can be printed. Several Print options exist. Click the **[Print]** button to review the printing options.



- **Orientation**: Select from the options Portrait or Landscape to set the page orientation
- **Page Size**: Select from **Letter** (8.5"x11"), **Legal** (8.5" x 14") or **Tabloid** (11"x14") to set the size of the page
- **Font Size**: Select a font size to print grid contents

  NOTE: By choosing the option **[ ] Fit Width to Page** the font size will automatically be calculated and used for printing
- **Print Range**: Select from the options **( ) All Records** or **( ) Selected Records** to determine the number of records to be printed
- **Include**: Select this option if you want to print the records with gridlines
- **Save current settings as default**: Click this link if you wish to save the settings as a default to be used during the next print

  NOTE: The settings are saved by user and by the individual print windows

3.2 Multi-Edit

Edit

The edit window is utilized throughout the program to edit data in a form-style layout allowing navigation from field to field. This presentation is seen when adding, editing and editing multiple pieces of information.

Multi-edit

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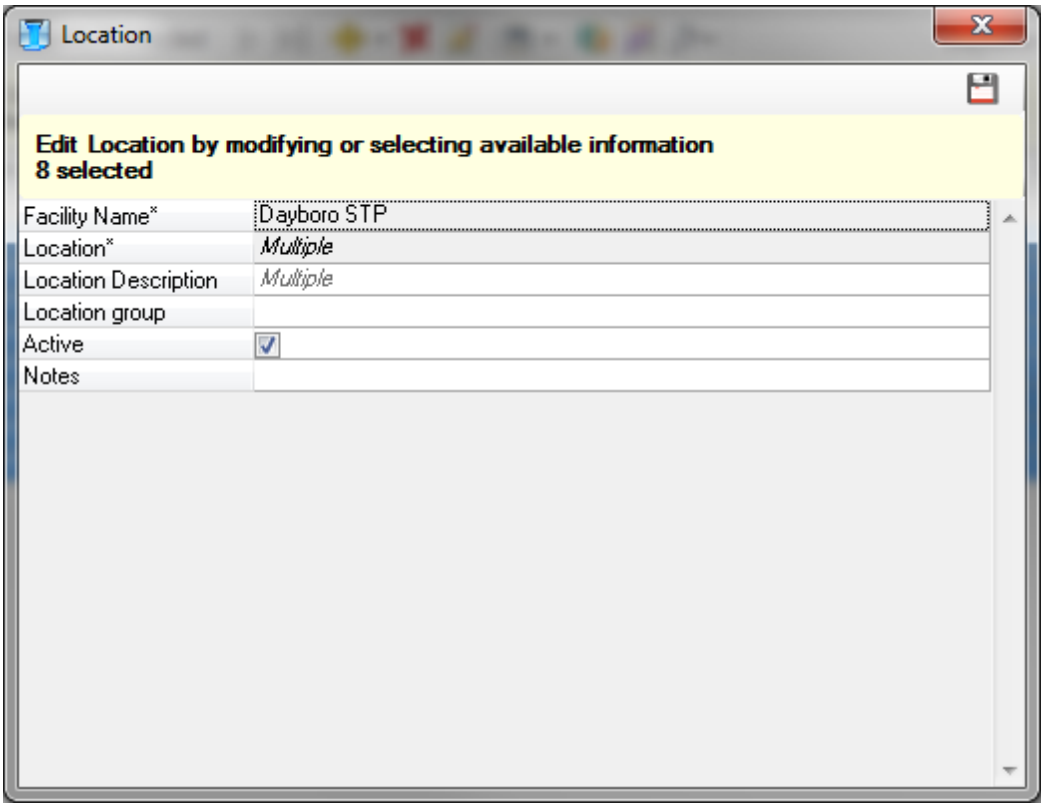
For users who desire to change multiple records at a time, while multiple records have been selected in the grid, clicking the **[Edit]** button will allow users to change data for the selected record(s).

Any available fields for editing will be shown in the Edit window. Additionally, the fields available for editing will vary depending on the section of the program.



3.3 Security

To access the **Security** section of Operator10 - Wastewater, go to the **File** menu and select **Security**. The Security section includes the following features; to learn more, click on the linked Help Topics:

User Security

User Security - The User Security section includes the ability to configure the following items:

- **Users** - Create new users and grant/deny access to database related features and functionality
- **Facilities** - Setup user access to facilities and facility related features and functionality
- **Groups** - Create groups for easy assignment of facility features and functionality
- **L:P Permissions** - Define user-specific permissions for Location:Parameters across permitted facilities

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Additional Topics

Additional topics related to Security:

- **Audit Trail** - Access the program generated, time-stamped list of data and program related entries
- **Windows Login** - The method by which Operator10 - Wastewater validates users

3.3.1 User Security

User Security

To access the User Security section of Operator10 - Wastewater, go to the **File** menu and select **Security**. The User Security section allows the creation of new Operator10 - Wastewater users and establishes Database-level Security.

Create a New User

To create a new user, click the **[Add]** button to begin.

Users will see a new window that will allow them to enter a unique User Name (0 to 30 characters) as well as additional user-specific information.

> ***NOTE:*** The creation of new User Names in Operator10 must follow the requirements using Windows Login in order ensure proper access to the application and database.

- **Description** - A description of the user (0 to 30 characters)
- **Position** - A definition of the position of the user within the organization (0 to 30 characters)
- **Department** - A definition of the department of the user within the organization (0 to 30 characters)
- **Region** - A definition of the region or section of the user within the organization (0 to 30 characters)
- **Enabled** - Determines whether the user is active and able to login into Operator10 (0 to 30 characters)

Click the **[Save]** button to save any data entered.

Upon entering the above information, security settings can be established on the right-side of the User Security window. The following security options are available.

- **Audit Trail** - Choices include Access or No Access and will enable/disable a user's ability to access the Audit Trail feature of Operator10
- **Backup** - Choices include Access or No Access and will enable/disable a user's ability to create a Backup of the selected database
- **Dashboard** - Choice include Edit/No Edit and will allow or disallow a user from editing the Dashboard of the selected database

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- **Database Admin** - Choices include Access or No Access and will enable/disable a user's ability to perform database-related operations
- **User Security** - Choices include Access or No Access and will enable/disable a user's ability to create and modify user security settings

3.3.2 User Facility Security

User - Facility Security

To establish facility-specific permissions for a user, access the User Security section of Operator10, go to the **File** menu and select **Security** and click on the **Facilities** Tab. The Facilities tab contains settings to enable or disable specific sections of the Operator10 program based on the selected record or current facility.

Add a User to a Facility

To allow a user access to a selected facility, click the **[Add]** button to begin.

Users will see a new window that will allow them to select a Facility, User Name and Group. Click the **[...]** button to the right of each field to choose from the list.

Click the **[Save]** button to save any data entered.

Upon selecting the above information, security settings can be established on the right-side of the User Security window. The following security options are available.

- **Applications (Bio)** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the BioSolids Application section
- **Calculate** - Choices include Access/No Access to enable/disable the ability to calculate data
- **Chemical** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Chemical section
- **Dataport** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Dataport section
- **Dataviews** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Dataview section
- **Default L:P Security** - Choices include View Only/Data Entry/Edit L:P/Full and acts as a default setting for all Location:Parameters (see note below for more information)
- **Formula** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Formula section
- **Graphing** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Graphing section
- **Import** - Choices include Access/No Access to enable/disable the ability to Import data
- **Limits (Bio)** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Limits section of the BioSolids Site Limits section

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- **Locked Data** - Choices include Access/No Access to enable/disable the ability to Lock Data for the selected facility
- **OPC/DDE** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the OPC/DDE Interface
- **Operator 10 Notes** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Notes section
- **Owners List (Bio)** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the BioSolids Owner section
- **Process History** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Process History section
- **Process Setup** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Process Setup section
- **Reports** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Reports section
- **Sampling Events** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Sampling Events section

NOTE: By setting the option for Default L:P Security, a single option can be selected for all Location:Parameters. Only those Location:Parameters modified under the L:P Permissions tab will have independent security settings. (see also: L:P Permissions)

IMPORTANT: Users assigned to a group will inherit the permissions of the selected group. All security settings will be disabled. The Group setting of **Custom** will allow exceptions to be made for the selected user.

The following is a legend for the various security options:

- **Access** - Allows user access to the selected section of Operator10 and enables use of that section
- **No Access** - Denies user access to the selected section of Operator10
- **View Only** - Allows user access to the selected section of Operator10 but does not permit any changes to be saved
- **Add/Edit** - Allows user access to the selected section of Operator10 **AND** permits changes to be saved
- **Delete** - Allows user access to the selected section of Operator10 **AND** permits changes to be saved AND ability to delete selected items
- **Data Entry** - Applies only to Location:Parameter security and allows users to enter/modify data
- **Edit L:P** - Applies only to Location:Parameter security and allows users to enter/modify data **AND** edit Location:Parameter details
- **Full** - Applies only to Location:Parameter security and allows users to enter/modify data **AND** edit Location:Parameter details **AND** delete Location:Parameters

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3.3.3 User L:P Permissions

Location:Parameter Permissions

To aid in the protection of Location:Parameter Data, Location:Parameter permissions can be established to allow or deny a users ability to manipulate data for selected Location:Parameters. To access the L:P Permissions section of Operator10 - Wastewater, go to the File menu and select Security and click on the L:P Permissions Tab.

To change L:P Security, select a user on the left side of the User Security screen. The listings on the left side of the User Security section are automatically populated for all User-Facility combinations from the Facilities tab. Information is read-only and should be modified on the Facilities tab if necessary.

L:P Security can be modified by selecting one or more records on the right side of the User Security screen. For individual modifications, users can use the drop-down menu to choose from the available options. For multiple L:P selections, users may use the Multi Edit functionality to make changes en masse.

The following is a legend for the various security options:

- **Default** - Applies inherited setting from User Security setting **Default L:P Security**
- **View Only** - Allows users to see data, read-only access
- **Data Entry** - Allows users to enter/modify data
- **Edit L:P** - Allows users to enter/modify data **AND** edit Location:Parameter details

3.3.4 Groups

User Group Security

To aid in the creation of facility-specific permissions for a user, access the User Security section of Operator10, go to the **File** menu and select **Security** and click on the Groups Tab. The Groups tab contains settings to enable or disable specific sections of the Operator10 program based on the selected record or current facility.

Users can be assigned to a group in the Facilities tab when creating User-Facility permissions.

Default groups have been created and are ready for use within Operator10 Security.

- **Denied** - Denies user access to modify any section of Operator10, users in this group cannot access or use any feature of Operator10
- **Full** - Permits user to access, modify and delete data from any section of Operator10, users in this group have full access
- **Restricted** - Permits user to access data from any section of Operator10, users in this group have Read-Only permissions

Create a Group

To create a new group to assign to users, click the **[Add]** button to begin.

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Users will see a new window that will allow them to enter a **Group Name** (1 to 30 characters) and **Description** (0 to 30 characters).

Click the **[Save]** button to save any data entered.

Upon selecting the above information, security settings can be established on the right-side of the User Security window. The following security options are available.

- **Applications (Bio)** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the BioSolids Application section
- **Calculate** - Choices include Access/No Access to enable/disable the ability to calculate data
- **Chemical** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Chemical section
- **Dataport** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Dataport section
- **Dataviews** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Dataview section
- **Default L:P Security** - Choices include View Only/Data Entry/Edit L:P/Full and acts as a default setting for all Location:Parameters (see note below for more information)
- **Formula** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Formula section
- **Graphing** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Graphing section
- **Import** - Choices include Access/No Access to enable/disable the ability to Import data
- **Limits (Bio)** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Limits section of the BioSolids Site Limits section
- **Locked Data** - Choices include Access/No Access to enable/disable the ability to Lock Data for the selected facility
- **OPC/DDE** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the OPC/DDE Interface
- **Operator 10 Notes** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Notes section
- **Owners List (Bio)** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the BioSolids Owner section
- **Process History** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Process History section
- **Process Setup** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Process Setup section
- **Reports** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Reports section
- **Sampling Events** - Choices include No Access/View Only/"Add/Edit"/Delete to limit access to the Sampling Events section

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NOTE: By setting the option for Default L:P Security, a single option can be selected for all Location:Parameters. Only those Location:Parameters modified under the L:P Permissions tab will have independent security settings. (see also: L:P Permissions)

IMPORTANT: Users assigned to a group will inherit the permissions of the selected group. All security settings will be disabled. The Group setting of Custom will allow exceptions to be made for the selected user.

The following is a legend for the various security options:

- **Access** - Allows user access to the selected section of Operator10 and enables use of that section
- **No Access** - Denies user access to the selected section of Operator10
- **View Only** - Allows user access to the selected section of Operator10 but does not permit any changes to be saved
- **Add/Edit** - Allows user access to the selected section of Operator10 AND permits changes to be saved
- **Delete** - Allows user access to the selected section of Operator10 AND permits changes to be saved AND ability to delete selected items
- **Data Entry** - Applies only to Location:Parameter security and allows users to enter/modify data
- **Edit L:P** - Applies only to Location:Parameter security and allows users to enter/modify data AND edit Location:Parameter details
- **Full** - Applies only to Location:Parameter security and allows users to enter/modify data AND edit Location:Parameter details AND delete Location:Parameters

3.4 Date/Calendar

Date/Calendar

NOTE: The following description of Date formats assumes the Windows default settings for **United States** users. The software also supports other Windows configuration settings for **International** users. Contact AllMax for additional information.

Dates for United States users are usually represented in the form "MM/DD/YY" where MM is a month from 01 to 12, DD is a day of the month from 01 to 31, and YY is the last two digits of the year from 0 to 99. Valid dates range from January 1, 1970 through December 31, 2037. Dates for **International** users are dependent on Windows settings.

Dates may be entered in a variety of manners:

- Delimiters may be omitted when the entered form is "MMDDYY" or "MMYY".
- Delimiters can be any of the following characters: / - : , .
- When using delimiters, the leading 0 may be omitted for month, day, or year.
- When using delimiters, the century may be omitted for the year.

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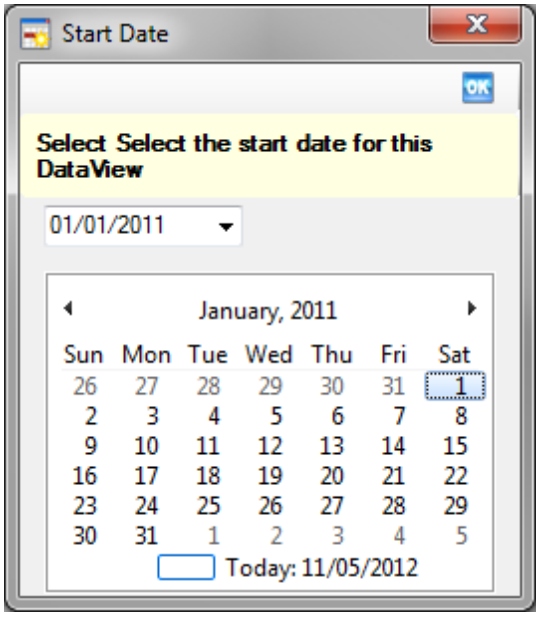
- The day and its delimiter may be omitted when specifying a month, or first day of month, "MM/YY" or "MMYY".
- Dates "wrap" when digits exceed expected values, e.g. "01/32/2000" represents February 1, 2000.

Examples:

- "020198" = February 1, 1998
- "2/1/98" = February 1, 1998
- "0298" = February 1, 1998 (first of month assumed)
- "12/31/04" = December 31, 2004
- "12-31-2004" = December 31, 2004

The Date may usually be selected from the Calendar dialog box by pressing the [...] popup button next to the Date. Use the [<] and [>] buttons to select the previous or next month, then press the appropriate [1 to 31] day button to enter the date.

NOTE: Easily return to the present date by Left-clicking any non-button area of the dialog box.



3.4.1 Relative Dates

Relative Dates

Relative Dates may also entered in place of any date: Enter the offset from the system date in the format "**±xm**", "**±d**", or "**±xm±y**". If the month offset is specified, **x** is the number of months from the current system date, and the first day of the month is assumed. If the day offset is specified, **y** is the number of days from either the first of the specified month (if a month offset is specified) or the current system date.

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NOTE: Relative Dates are especially useful where they do not need to be re-entered, such as data ranges for DataViews, Graphs, Locked Data or Calculations.

Examples:

- "+1m" = The first day of the following month
- "+0m" = The first day of the current month
- "+30" = The day 30 days from the current day
- "-7" = The day one week ago
- "+1m+15" = The fifteenth of the following month
- "+1m-1" = The last day of the current month (The day preceding the first day of the following month)

3.4.2 Time

Time

Times are usually represented in the form "HH:MM" where HH is an hour from 00 to 24 and MM is a minute from 00 to 59. Valid times range from 00:01 through 24:00.

Time may be entered in a variety of manners:
Delimiters may be omitted when the entered form is "HHMM".
Delimiters can be any of the following characters: / - : , .
When using delimiters, the leading 0 may be omitted for hour or minute.
"a(m)" or "p(m)" may be entered immediately following the time to indicate a.m. or p.m.

Examples:"0201" = 02:01
"2:1" = 02:01
"0201p" = 14:01
"02/01a" = 02:01

3.5 Audit Trail

Audit Trail

The Audit Trail is a secure, computer generated, time-stamped audit trail which independently monitors operator entries and actions that create, update, or delete data. Changes to data do not obscure previously recorded information--new records are created for each event. The Audit Trail also includes information on other user activity such as User login attempts, opening a new Facility, etc. Each event recorded in the Audit Trail will consume approximately 400 bytes of storage space. Auditing features require an Auditing License--when licensed, the Audit Trail cannot be disabled. Contact AllMax for additional information.

Accessing the Audit Trail

To access the Audit Trail, go to the **File** menu and choose **Audit Trail** to display

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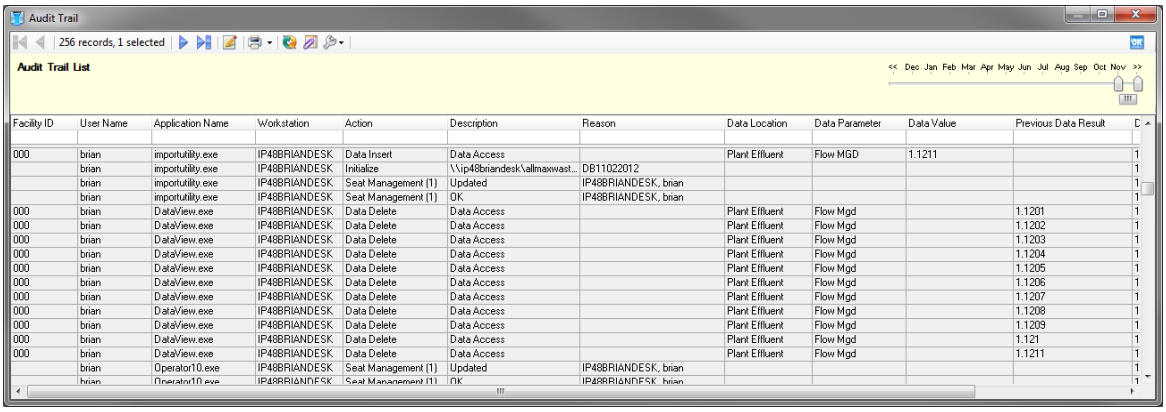
the Audit Trail section.


Audit Trail
256 records, 1 selected
Audit Trail List
<< Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov >>
Facility ID | User Name | Application Name | Workstation | Action | Description | Reason | Data Location | Data Parameter | Data Value | Previous Data Result
000 brian importutility.exe IP48BRIANDESK Data Insert Data Access Plant Effluent Flow MGD 1.1211
brian importutility.exe IP48BRIANDESK Initialize \\ip48briandesk\allmaxwast... DB11022012
brian importutility.exe IP48BRIANDESK Seat Management (1) Updated IP48BRIANDESK, brian
brian importutility.exe IP48BRIANDESK Seat Management (1) OK IP48BRIANDESK, brian
000 brian DataView.exe IP48BRIANDESK Data Delete Data Access Plant Effluent Flow Mgd 1.1201
000 brian DataView.exe IP48BRIANDESK Data Delete Data Access Plant Effluent Flow Mgd 1.1202
000 brian DataView.exe IP48BRIANDESK Data Delete Data Access Plant Effluent Flow Mgd 1.1203
000 brian DataView.exe IP48BRIANDESK Data Delete Data Access Plant Effluent Flow Mgd 1.1204
000 brian DataView.exe IP48BRIANDESK Data Delete Data Access Plant Effluent Flow Mgd 1.1205
000 brian DataView.exe IP48BRIANDESK Data Delete Data Access Plant Effluent Flow Mgd 1.1206
000 brian DataView.exe IP48BRIANDESK Data Delete Data Access Plant Effluent Flow Mgd 1.1207
000 brian DataView.exe IP48BRIANDESK Data Delete Data Access Plant Effluent Flow Mgd 1.1208
000 brian DataView.exe IP48BRIANDESK Data Delete Data Access Plant Effluent Flow Mgd 1.1209
000 brian DataView.exe IP48BRIANDESK Data Delete Data Access Plant Effluent Flow Mgd 1.121
000 brian DataView.exe IP48BRIANDESK Data Delete Data Access Plant Effluent Flow Mgd 1.1211
brian Operator10.exe IP48BRIANDESK Seat Management (1) Updated IP48BRIANDESK, brian

The Audit Trail tracks and displays changes to the database made by all users.

Enabling the Audit Trail

To enable the Audit Trail feature, users must go to the **File** menu item and choose **Open Database**. From the Open Database window, users can locate a Database with auditing licenses and check the checkbox in the Auditing column to turn on the Audit Trail.

> ***NOTE:*** When turning the Audit Trail feature on, an initial audit of all data presently stored in the database will take place. For new databases, this period of initial audit is very short, as there is limit or no data in the database to audit. However, for existing and established databases, the initial audit time may be lengthy.

Information Recorded in Audit Trail

Available information includes:

- DateTime of Audit Trail record in YYYY/MM/DD HH:MM:SS format
- Facility ID
- User Name
- Application
- Workstation
- Action
- Description
- Reason
- data information:
    - DateTime in YYYYMMDDHHMM format (Daily data will have an HHMM of "0000")
    - Location Name
    - Parameter Name
    - Value
    - Previous Value

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NOTE: The grids displayed in the Sampling Event section of Operator10 - Wastewater have the general properties of the Grid and Grid Edit windows. (For more information about these sections, please see the topic: Grid Functionality).

To find audit trail data for a period of time, use the slider bars in the area above the grid. Slide each bar separately to increase or decrease the time frame.

3.6 Windows Login

Windows Login

Operator10 - Wastewater Data Management utilizes information from the Microsoft Windows Operating System relating to current User. In an effort to make the login process to Operator10 - Wastewater smooth and efficient, AllMax Software has implemented Windows Login which validates the current Windows User against a valid Operator10 - Wastewater user and if successful, allows entry into the Operator10 - Wastewater application.

In previous versions of Operator10 - Wastewater, users and passwords could be defined and thus permit/deny access to Operator10 - Wastewater. Operator10 - Wastewater now requires a valid user name that would match a user from the Windows Operating System. This effort to validate the current Windows User without requiring a separate password for Operator10 - Wastewater allows a user quicker access and instant validation for use of Operator10 - Wastewater.

3.7 Auto-Update

Operator10 - Wastewater updates can now be managed in an automated process whereby Operator10 - Wastewater connects to the AllMax Software website and verifies version information to prompt users when a new version is available for download. This process will be performed automatically by default but can be skipped or turned off if desired.

Check for Update

Upon opening Operator10 - Wastewater, Operator10 - Wastewater will connect to the AllMax Software website (www.allmaxsoftware.com) and verify the current running version of the application against the newest available version. If the version installed is older than the current available version, a prompt to review new features and functionality is provided as well as a way to update the computer with the newest version of Operator10 - Wastewater.

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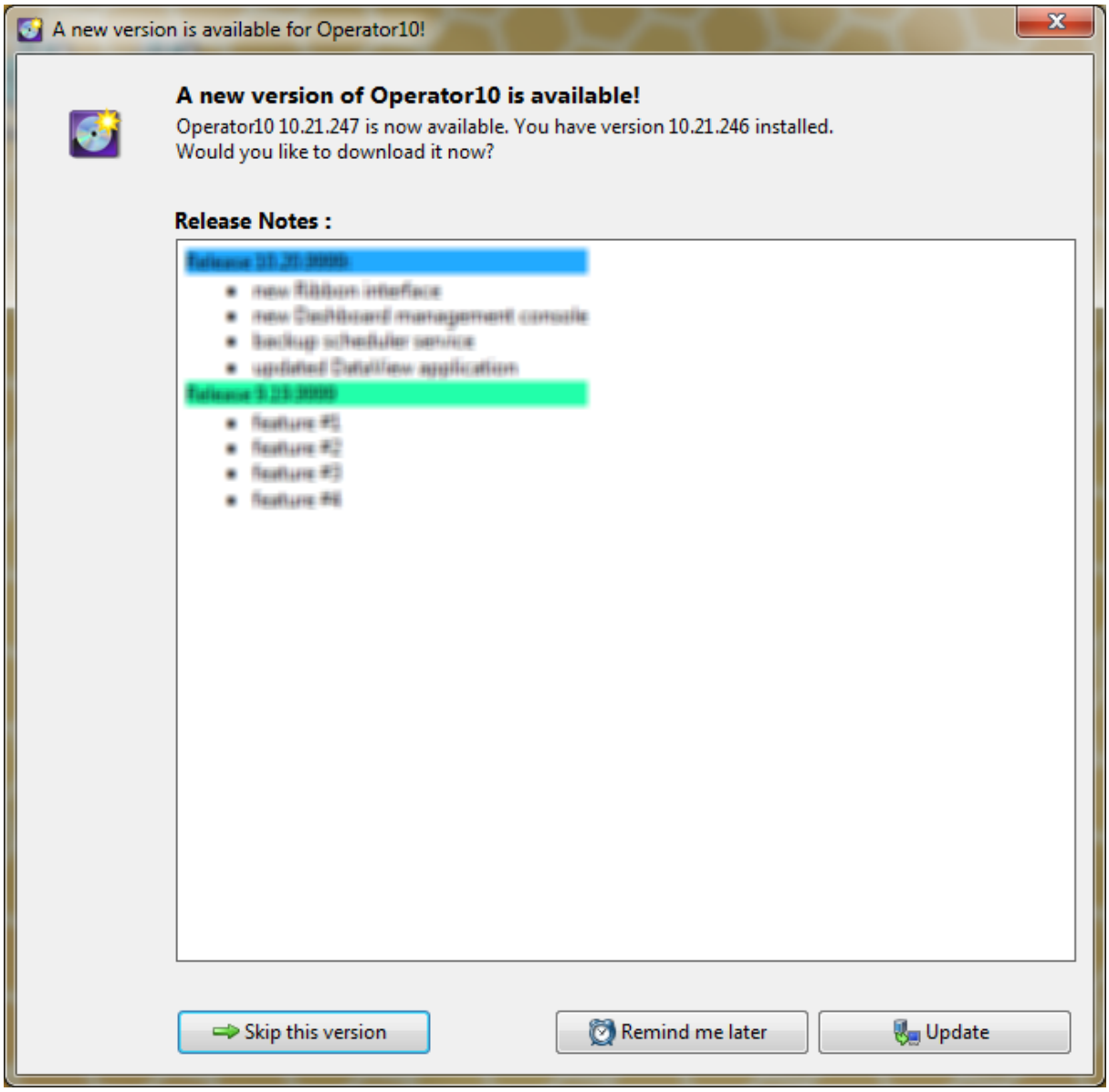
A new version is available for Operator10!
A new version of Operator10 is available!
Operator10 10.21.247 is now available. You have version 10.21.246 installed.
Would you like to download it now?
Release Notes :
Skip this version
Remind me later
Update

The New Version notification displays information related to any new release of Operator10 - Wastewater with details of features and functionality to be found in the new version.

Download and Update

Once downloaded, the update to Operator10 - Wastewater will be run. Once initiated, it is a requirement that any running instance of Operator10 - Wastewater on the computer be exited. The update process will indicate any running Operator10 - Wastewater applications or support applications and offer to shut these application down as part of the update process. Acknowledge the prompts to confirm forced exit.

The update will be performed on the local computer only and will not be pushed or performed on any other workstation(s)/client computer(s) or server(s). The update MUST be performed separately on each computer, however, the same prompt will be received to indicate that an update is available.

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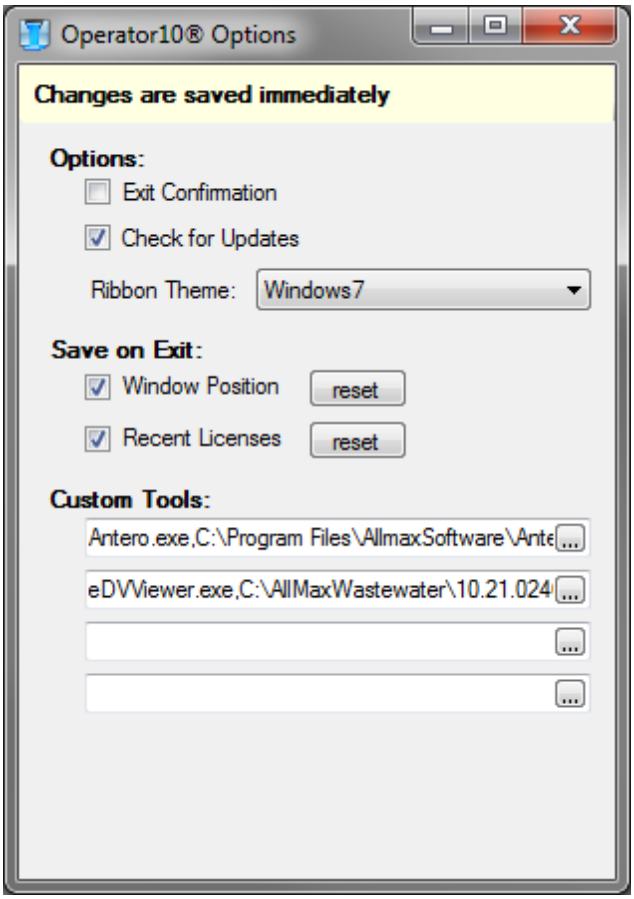
Update Options

The following options are available to dictate how and when the update notification is received.

Check for Updates

An option is available to turn off update notifications at the application level. In the main application window, go to the File menu, choose Setup, then choose Options and find the Check for Updates option. Place a check in the checkbox to turn on prompting for new versions on this computer. Removing the checkbox for the option Check for Updates will turn off notifications and prompting for new versions on this computer.



Skip This Version

When displayed the new version availability window displays a Skip This Version button. Using this option will flag this version and disable the notification until a new version is available.

Remind Me Later

When displayed the new version availability window displays a Remind Me Later option. Use this option to suppress reminders for a selected period of time.

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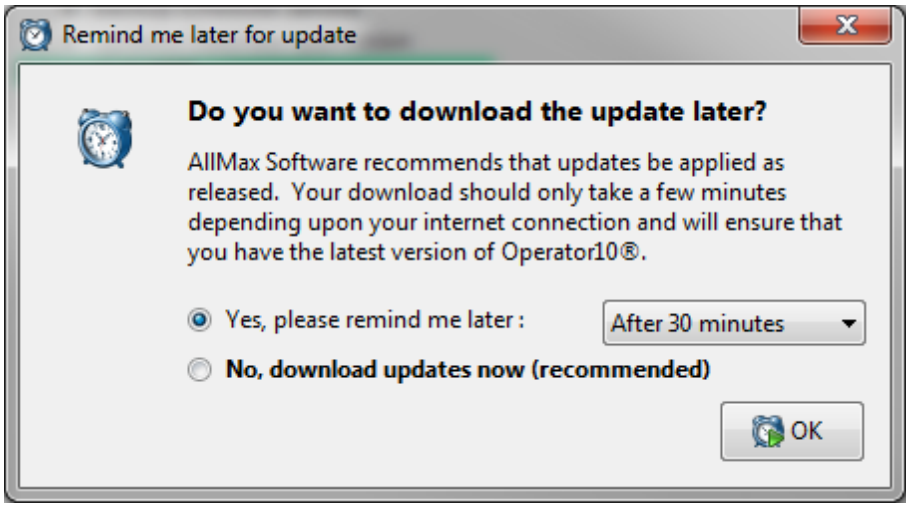
Remind me later for update
Do you want to download the update later?
AllMax Software recommends that updates be applied as released. Your download should only take a few minutes depending upon your internet connection and will ensure that you have the latest version of Operator10®.
Yes, please remind me later :
After 30 minutes
No, download updates now (recommended)
OK

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Part

4 Main Application

Topics in this section include:

- Application Characteristics
- Database
- Facility
- Location
- Parameter
- Location:Parameter
- Data
- Process Control
- Formula
- Alpha Codes
- Chemicals
- Barcode Labels
- Calculations
- Logged Documents

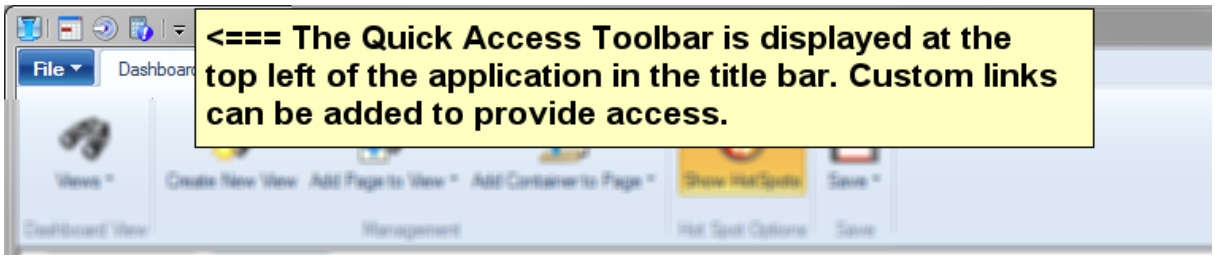
4.1 Application Characteristics

Topics in this section include:

- Quick Access Toolbar
- Menu System
- Operator10 Options

4.1.1 Quick Access Toolbar

The Quick Access Toolbar is a small toolbar that is visible in the top-left hand corner of Operator10 - Wastewater and is able to be customized to include access to features and functionality found in the ribbons of the application.


<=== The Quick Access Toolbar is displayed at the top left of the application in the title bar. Custom links can be added to provide access.
File

Add Items to Quick Access Toolbar

To add icons to the Quick Access Toolbar, users can perform the following steps:

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1. From any icon or menu item **right-click** and choose **Add to Quick Access Toolbar**
2. The icon or menu item will be added to the Quick Access Toolbar and available for use

Remove Items from Quick Access Toolbar

To remove icons from the Quick Access Toolbar, perform the following steps:

1. **Right-click** on any icon in the Quick Access Toolbar
2. Choose **Remove from Quick Access Toolbar**

4.1.2 Menu System

Topics in this section include:

- File Menu
- Dashboard Ribbon
- View Ribbon
- Setup Ribbon
- BioSolids Ribbon
- Pretreatment Ribbon (Not available in Operator10 for Water and Wastewater)
- Tools Ribbon
- Support Ribbon
- Help Ribbon

4.1.2.1 File Menu

Main Application - File Menu

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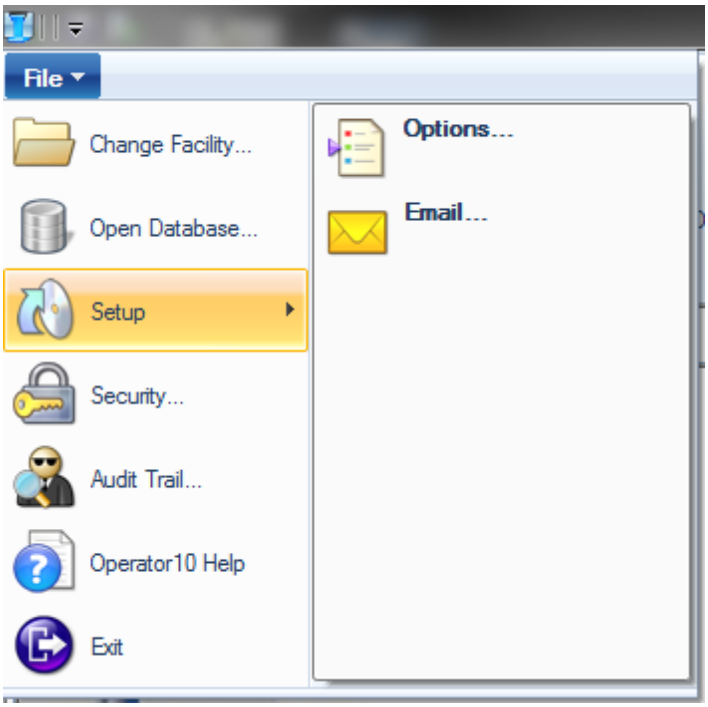

The Main Application File menu provides users with access to the following features:

- **Change Facility...** - Opens a Facility picklist allowing the user to select a Facility from the current Database
- **Open Database...** - Opens the Database/Facility picklist allowing the user to choose a new facility from any Database
- **Setup** - Provides the following options:
  - **Options...** - Opens the Operator10 - Wastewater Options dialog
  - **Email...** - Opens a utility in which email settings can be defined for use when printing/previewing
- **Security...** - Opens the User Security section
- **Audit Trail...** - Opens the Audit Trail section
- **Operator10 Help** - Opens the Operator10 Help File
- **Exit** - Closes the Operator10 - Wastewater Application

4.1.2.2 Dashboard Ribbon

Main Application - Dashboard Ribbon

The Dashboard ribbon provides the following functionality:

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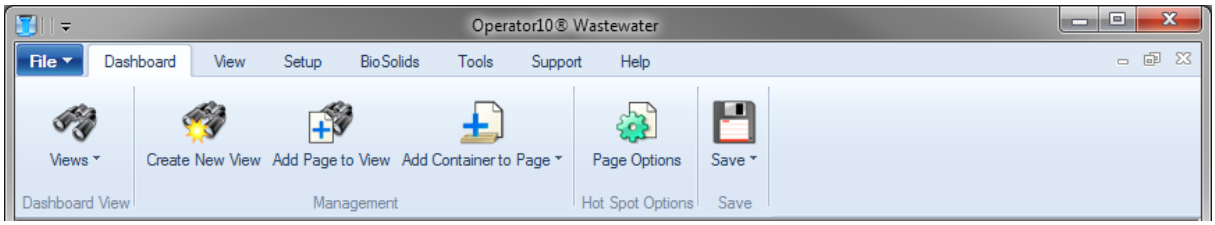

The Dashboard Ribbon allows for the management of Dashboard Views, Pages and Containers.

Dashboard Functions

The following options are available in the Dashboard ribbon (and are discussed as they appear in the button groups):

Dashboard View:

- **Views** - Press the **[Views]** button to drop down a list of available Views for the database; choose **Open List of Views...** to view the View list

Management:

- **Create New View** - Press the **[Create New View]** button to create a new View for the database
- **Add Page to View** - Press the **[Add Page to View]** button to add a Page to a View
- **Add Container to Page** - Press the **[Add Container to Page]** button to select from the list of Container types to be added to the View

HotSpot Options:

- **Page Options** - Press the **[Page Options]** button to set Page Properties for the Page

Save:

- **Save** - Press the **[Save]** button to Save the current View settings or to Save As...

4.1.2.3 View Ribbon

Main Application - View Ribbon

The View ribbon provides the following functionality:

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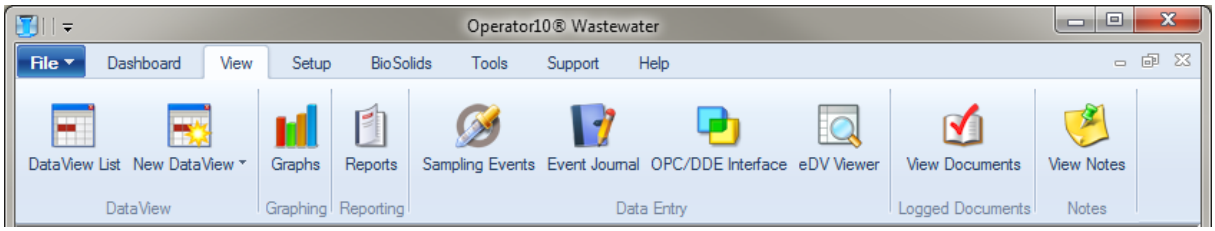

The View Ribbon allows users to access sections of Operator10 like DataViews, Reports, Graphs and more.

View Functions

The following options are available in the View ribbon (and are discussed as they appear in the button groups):

DataView:

- **DataView** - Press the **[DataView]** button to open the DataView List
- **New DataView** - Press the **[New DataView]** button to choose from the list of available DataView Types to create a new DataView

Graphing:

- **Graphs** - Press the **[Graphs]** button to open the Graphing section of Operator10 - Wastewater

Reporting:

- **Reports** - Press the **[Reports]** button to open the Reporting section of Operator10 - Wastewater

Data Entry:

- **Sampling Events** - Press the **[Sampling Events]** button to open the Sampling Events section of Operator10 - Wastewater
- **Event Journal** - Press the **[Event Journal]** button to open the Event Journal section of Operator10 - Wastewater

  (Event Journal only available in Synexus Pretreatment Data Management Application)
- **OPC/DDE Interface** - Press the **[OPC/DDE Interface]** button to open the OPC/DDE Interface section of Operator10 - Wastewater

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- **eDV Viewer** - Press the **[eDV Viewer]** button to open the eDV Viewer application

Logged Documents:

- **View Documents** - Press the **[View Documents]** button to open the Logged Documents section of Operator10 - Wastewater

Notes:

- **View Notes** - Press the **[View Notes]** button to access the Notes section

4.1.2.4 Setup Ribbon

Main Application - Setup Ribbon

The Setup ribbon provides the following functionality:

The Setup Ribbon allows users to access sections of Operator10 like Location:Parameters, Process, Formulas and more.

Setup Functions

The following options are available in the Setup ribbon (and are discussed as they appear in the button groups):

Location:Parameter:

- **Locations** - Press the **[Locations]** button to open the Location list
- **L:Ps** - Press the **[L:Ps (Location:Parameters)]** button to open the Location:Parameter list
- **Stock Parameters** - Press the **[Stock Parameters]** button to open the Stock Parameter list

Process:

- **Processes** - Press the **[Processes]** button to open the Process list

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- **Process History** - Press the **[Process History]** button to open the Process History list

Chemical:

- **Chemicals** - Press the **[Chemicals]** button to open the Chemical section

Formula:

- **Formulas** - Press the **[Formulas]** button to open the Formulas section

Alpha Code:

- **Alpha Codes** - Press the **[Alpha Codes]** button to open the Alpha Codes section

Barcode Labels:

- **Labels List** - Press the **[Label List]** button to access the Barcode Labels List
- **Print** - Press the **[Print]** button to select from the list of available data sections to be printed as barcode labels

DataPort:

- **Select L:Ps** - Press the **[Select L:Ps]** button to access the list of Location:Parameters to be exported to the DataPort for data entry
- **Setup** - Press the **[Setup]** button to select from a list of setup items related to DataPort Setup items

4.1.2.5 BioSolids Ribbon

Main Application - BioSolids Ribbon

The BioSolids ribbon provides the following functionality:

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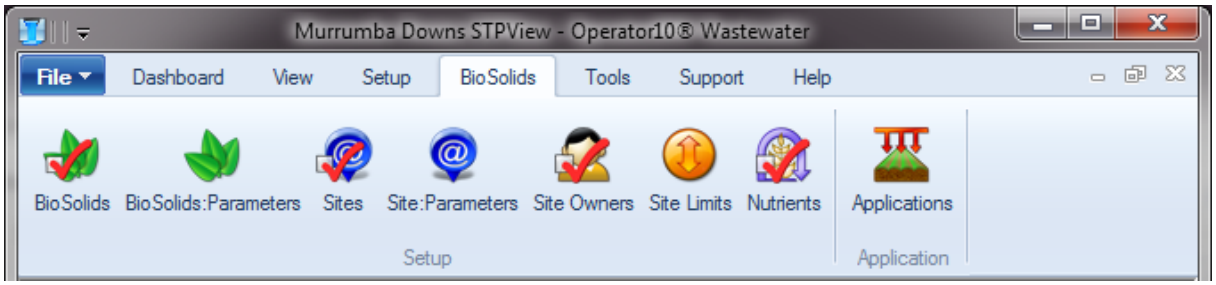

The BioSolids Ribbon allows users to access sections of Operator10 specific to the licensed BioSolids features of Operator10.

BioSolids Functions

The following options are available in the BioSolids ribbon (and are discussed as they appear in the button groups):

Setup:

- **BioSolids** - Press the **[BioSolids]** button to open the BioSolids List
- **BioSolids:Parameters** - Press the **[BioSolids:Parameters]** button to open the BioSolids:Parameters list
- **Sites** - Press the **[Sites]** button to open the BioSolids Site List
- **Site:Parameters** - Press the **[Site:Parameters]** button to open the BioSolids Site:Parameters list
- **Site Owners** - Press the **[Site Owners]** button to open the BioSolids Site Owners list
- **Site Limits** - Press the **[Site Limits]** button to open the BioSolids Site Limits list
- **Nutrients** - Press the **[Nutrients]** button to open the Nutrient list

Application:

- **Applications** - Press the **[Applications]** button to open the Application list

4.1.2.6 Tools Ribbon

Main Application - Tools Ribbon

The Tools ribbon provides the following functionality:

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The Tools ribbon displays various tools and utilities avialable for use within Operator10.

Tools Functions

The following options are available in the Tools ribbon (and are discussed as they appear in the button groups):

Database Backup:

- **Backup Now** - Click the **[Backup Now]** button to backup the current database

Calculations:

- **Calculate Now** - Press the **[Calculate Now]** button to calculate functions and formulas for the open database
- **Month-to-Date** - Press the **[Month-to-Date]** button to automatically calculate data for the current month to date
- **Previous Month-to-Date** - Press the **[Previous Month-to-Date]** button to automatically calculate data for the previous month to date
- **Change Order** - Press the **[Change Order]** button to edit the Calculation Order

Import/Export Data:

- **Import Now** - Press the **[Import Now]** button to import data
- **Browse for Import File(s)** - Press the **[Browse for Import File(s)]** button to browse for specific files to be imported
- **Export Data** - Press the **[Export Data]** to build an export file containing selected Location:Parameter data

Scheduling:

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- **Setup Schedules** - Press the **[Setup Schedules]** button to open the Operator10 Agent Interface window to begin scheduling items; Backups, Data Imports and Facility Calculations can be scheduled using the Operator10 Agent.

Useful Tools:

- **Calculator** - Press the **[Calculator]** button to use the Calculator Tool
- **Tools, Calculators, and Converters** - Press the **[Tools, Calculators, and Converters]** button to open the Operator10 Tools section
- **Custom Tools** - Press the **[Custom Tools]** button to select from a list of Custom Tools
- **Locked Data** - Press the **[Locked Data]** button to open the Locked Data tool

4.1.2.7 Support Ribbon

Support Menu

The Support menu in the main application toolbar displays specific help and support options available to clients who have a current support contract and keycode with AllMax Software, Inc.

Options available in the Support menu include:

- **License #:** Displays the license number as provided by AllMax Software.
- **Check for Updates:** Displays notification of current updates available from AllMax Software.
- **File Versions:** Opens the Check Version Utility
- **go2tech:** (Internet Connection required) Begins a new session with AllMax Software Technical Support. View the go2tech topic to learn more.
- **Web Support:** (Internet Connection required) Takes users to support form on AllMax Software's website. Form information is sent directly to Technical Support Representatives.
- **Email Support:** (Internet Connection required) Initializes a new email message, addressed to AllMax Software Technical Support staff.
- **Error Log:** Provides a link to the error log of Operator10 - Wastewater.

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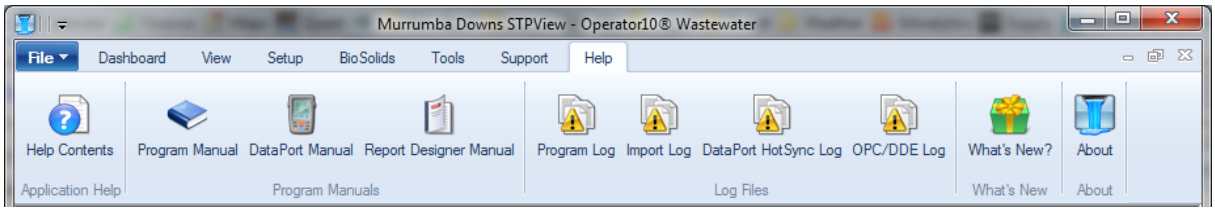
4.1.2.8 Help Ribbon

Main Application - Help Ribbon

The Help ribbon provides the following functionality:



The Help ribbon displays information and access to various help topics and log information.

Help Functions

The following options are available in the Help ribbon (and are discussed as they appear in the button groups):

Application Help:

- **Help Contents** - Click the **[Help Contents]** button to open the Help File

Program Manuals:

- **Program Manual** - Press the **[Program Manual]** button to open the PDF manual for Operator10 - Wastewater
- **DataPort Manual** - Press the **[DataPort Manual]** button to open the PDF manual for the DataPort Handheld
- **Report Designer Manual** - Press the **[Report Designer Manual]** button to open the List and Label Report Designer Manual

Log Files:

- **Program Log** - Press the **[Program Log]** button to open the Operator10 - Wastewater program log file
- **Import Log** - Press the **[Import Log]** button to open the Import Utility log file
- **DataPort HotSync Log** - Press the **[DataPort HotSync Log]** button to open the DataPort HotSync log file

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- **OPC/DDE Log** - Press the **[OPC/DDE Log]** to open the OPC/DDE Interface log file

What's New:

- **What's New?** - Press the **[What's New?]** button to open the What's New document (opens an externally linked PDF from the AllMax Software, Inc. website)

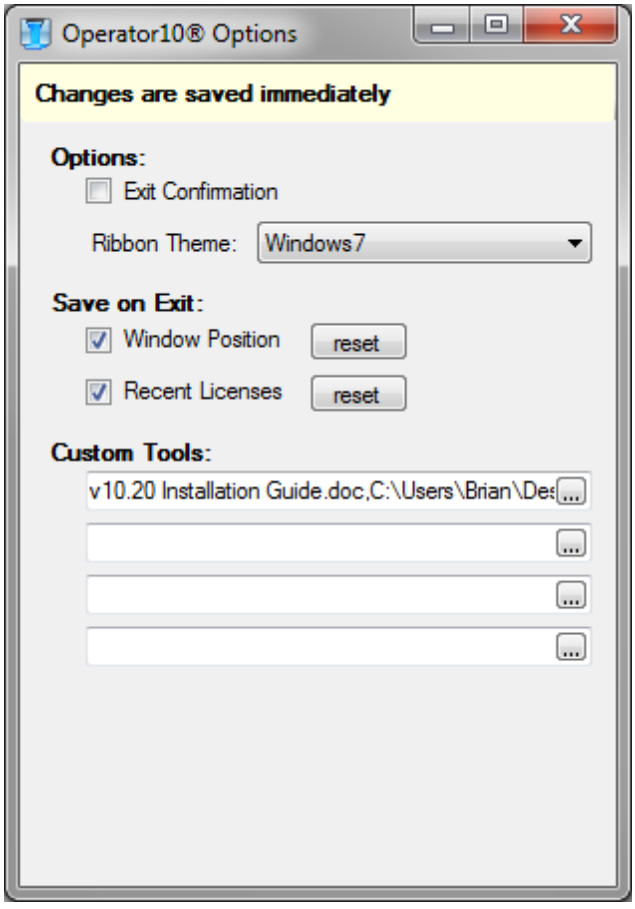
About:

- **About** - Press the **[About]** button to open the Help | About section

4.1.3 Operator10 Options

Operator10 Options

The Operator10 Options allows users to define and save program options. Program options found in the Operator10 Options dialog are saved based on the current user of the application and information is stored in the registry for the computer.



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Options

Items listed under the **Options:** section include:

- **Exit Confirmation:** Place a check in the **[ ] Exit Confirmation** checkbox to provide a prompt upon exit of the Main Application.
- **Ribbon Theme:** Select from the drop-down menu to choose the appearance option for the ribbons and other "themed" elements in the Main Application and DataView sections.

Save on Exit

Items listed under the **Save on Exit:** include:

- **Window Position:** Place a check in the **[ ] Window Position** checkbox to save the position of the Main Application and other windows when opening/closing the application.

  Press the **[reset]** button to clear all existing positions and reset positions to default
- **Recent Licenses:** Place a check in the **[ ] Recent Licenses** checkbox to save the previous license information to the registry.

  Press the **[reset]** button to clear all existing recent licenses

Custom Tools

Users can define up to 4 custom tools that can be accessed from the Tools ribbon. Custom tools are links to external files. Click the **[...]** button to browse and select a file to be opened using the custom tools menu option.

4.2 Database

Database

From the Database/Facility list, users have the ability to perform many actions. Users of Operator10 - Wastewater who have permission to do so can:

- Create New Database
- Create New Facility
- Delete Database
- Delete Facility
- Import/Export Facility Data
- Backup Databases
- Set Database Properties

Accessing Database/Facility

To access the Database/Facility section, go to the **File** menu and choose the **Open**

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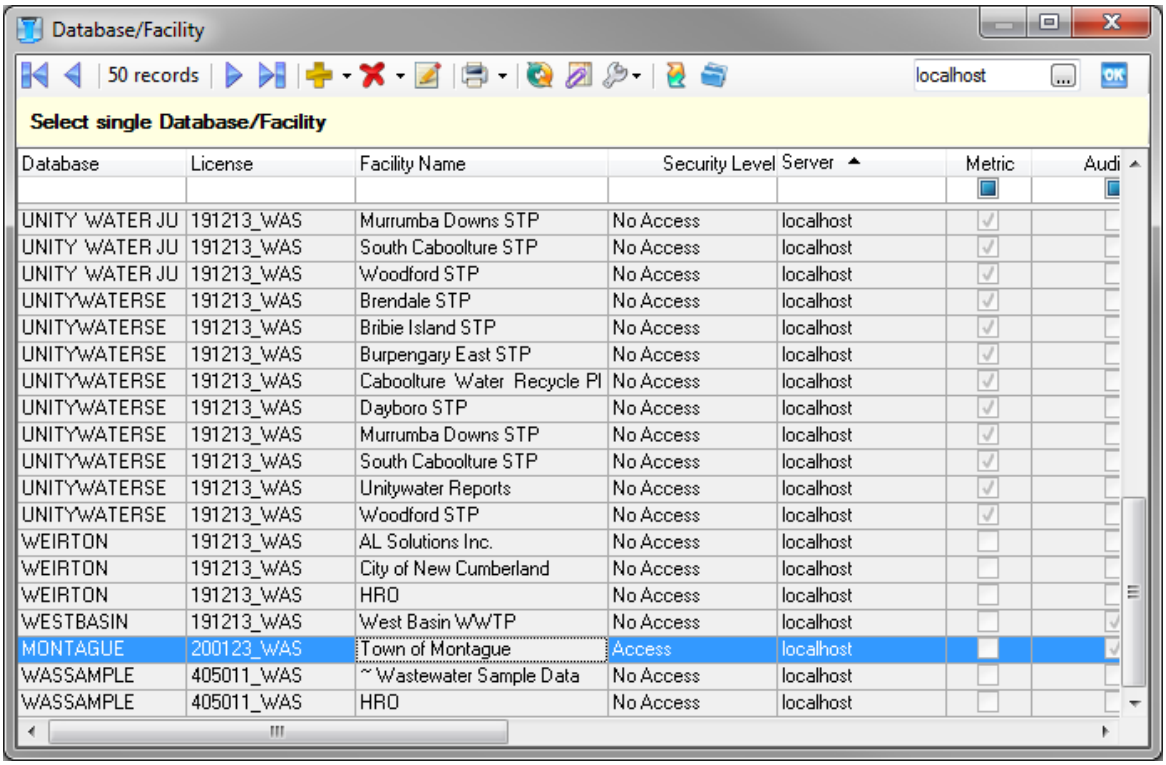
Database... option.



Database	License	Facility Name	Security Level	Server	Metric	Audi
UNITY WATER JU	191213_WAS	Murrumba Downs STP	No Access	localhost	☑	☐
UNITY WATER JU	191213_WAS	South Caboolture STP	No Access	localhost	☑	☐
UNITY WATER JU	191213_WAS	Woodford STP	No Access	localhost	☑	☐
UNITYWATERSE	191213_WAS	Brendale STP	No Access	localhost	☑	☐
UNITYWATERSE	191213_WAS	Bribie Island STP	No Access	localhost	☑	☐
UNITYWATERSE	191213_WAS	Burpengary East STP	No Access	localhost	☑	☐
UNITYWATERSE	191213_WAS	Caboolture Water Recycle Pl	No Access	localhost	☑	☐
UNITYWATERSE	191213_WAS	Dayboro STP	No Access	localhost	☑	☐
UNITYWATERSE	191213_WAS	Murrumba Downs STP	No Access	localhost	☑	☐
UNITYWATERSE	191213_WAS	South Caboolture STP	No Access	localhost	☑	☐
UNITYWATERSE	191213_WAS	Unitywater Reports	No Access	localhost	☑	☐
UNITYWATERSE	191213_WAS	Woodford STP	No Access	localhost	☑	☐
WEIRTON	191213_WAS	AL Solutions Inc.	No Access	localhost	☐	☐
WEIRTON	191213_WAS	City of New Cumberland	No Access	localhost	☐	☐
WEIRTON	191213_WAS	HRO	No Access	localhost	☐	☐
WESTBASIN	191213_WAS	West Basin WWTP	No Access	localhost	☐	☑
MONTAGUE	200123_WAS	Town of Montague	Access	localhost	☐	☑
WASSAMPLE	405011_WAS	~Wastewater Sample Data	No Access	localhost	☐	☐
WASSAMPLE	405011_WAS	HRO	No Access	localhost	☐	☐

4.2.1 Add New Database

Users with permission to do so, may create new databases for use within Operator10. Each database created will allow for separate data storage of facility, location, parameter, data, etc. For more information on database and data storage, see the following help topic for Database Structure.

Add New Database

1. In the Database/Facility window, click the arrow beside the **[Add]** button, select Create a new database.
2. To create a new Database, enter a **Database*** name (1 to 20 characters) and continue editing.
3. Choose a **License*** to add this Database to, click the **[...]** button to view the list of available licenses, select a License and click the **[OK]** button to choose the license.
4. To enable the Audit Trail for this database, place a check in the checkbox for **Auditing**.
5. To use Metric units of measurement for this database, place a check in the checkbox for **Metric**.
6. Click the **[Save]** button to create the new database.

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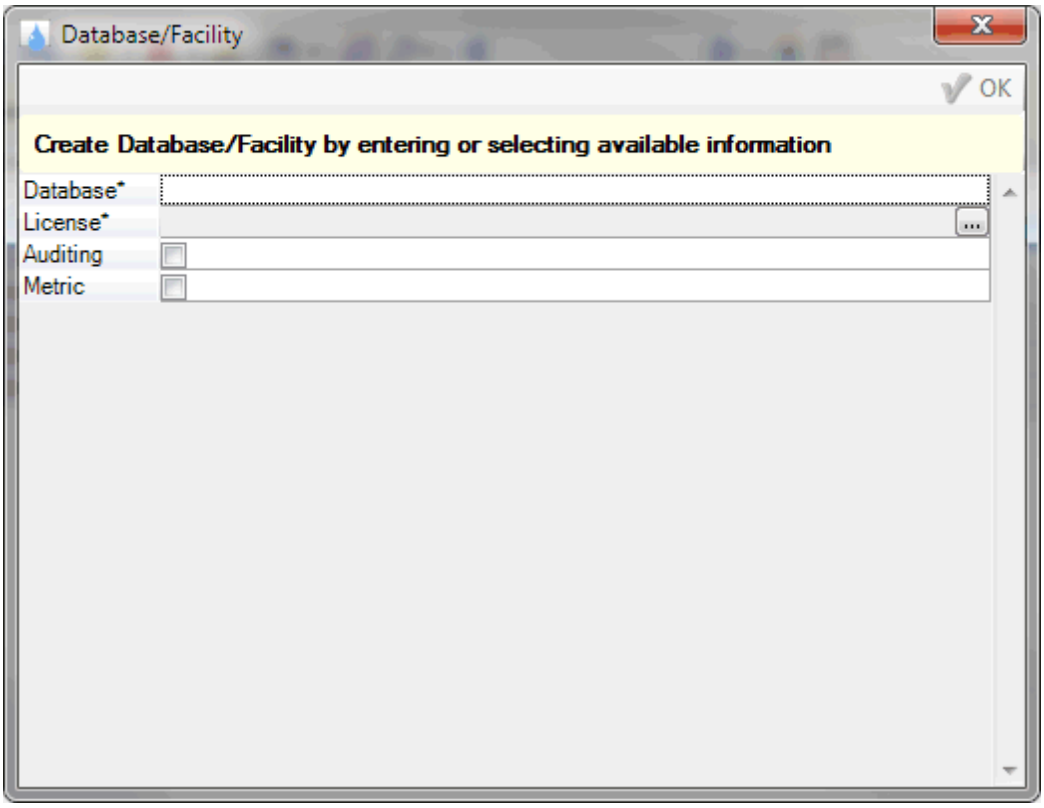

Add New Database from Backup (Restore)

Backups created from within Operator10 can be restored as full databases.

1. To create a new database from a backup, click the arrow beside the **[Add]** button, select **Add New Database From Backup**.
2. In the next window that appears, browse to the location of the Operator10 database backup file. Click **[Open]** to begin the process.
3. In the next window that appears, enter a new **Database*** name for use in Operator10.
4. Choose a **License*** to add this Database to, click the **[...]** button to view the list of available licenses, select a License and click the **[OK]** button to choose the license.
5. Click the **[Save]** button to create the new Database.
6. The Import process will now begin. Upon completion, you will be able to select a facility from the new Database for use.

Add New Sample Database

A sample database can be created as needed using an option found on the **[Add]** button. Select **Add New Sample Database** from the menu to automatically add a sample database for Operator10 - Wastewater.

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The process of adding a sample database is performed in a relatively hands-free manner allowing users to select the option, confirm the operation and allow the application to perform the process of sample database creation. Upon successful creation, the Sample Database and Facility will be able to be selected from the Open Database window.

4.2.2 Add New Facility

Add New Facility

In the Database/Facility window, click the **[Add]** button to begin the process.

1. To create a new Facility, enter the name of the **Facility*** (1 to 30 characters) and continue editing
2. To edit a Facility, fill in any information for the following fields:
   - **Address** lines [1-3] (0 to 30 characters)
   - **City** (0 to 20 characters)
   - **State/Province** (0 to 20 characters)
   - **Zip** (0 to 10 characters)
   - **Country** (0 to 17 characters)
   - **Report State** (selection)
   - **Hourly Entry Type** (24 Whole Hours or Any Time)

   NOTE: Hourly Entry Type may allow either 24 hourly times (24 Whole Hours) from 01:00 through 24:00, or all times (Any Time) by specifying minutes such as 12:15 or 08:43.

When entries are complete, press **[OK]** to close the dialog.

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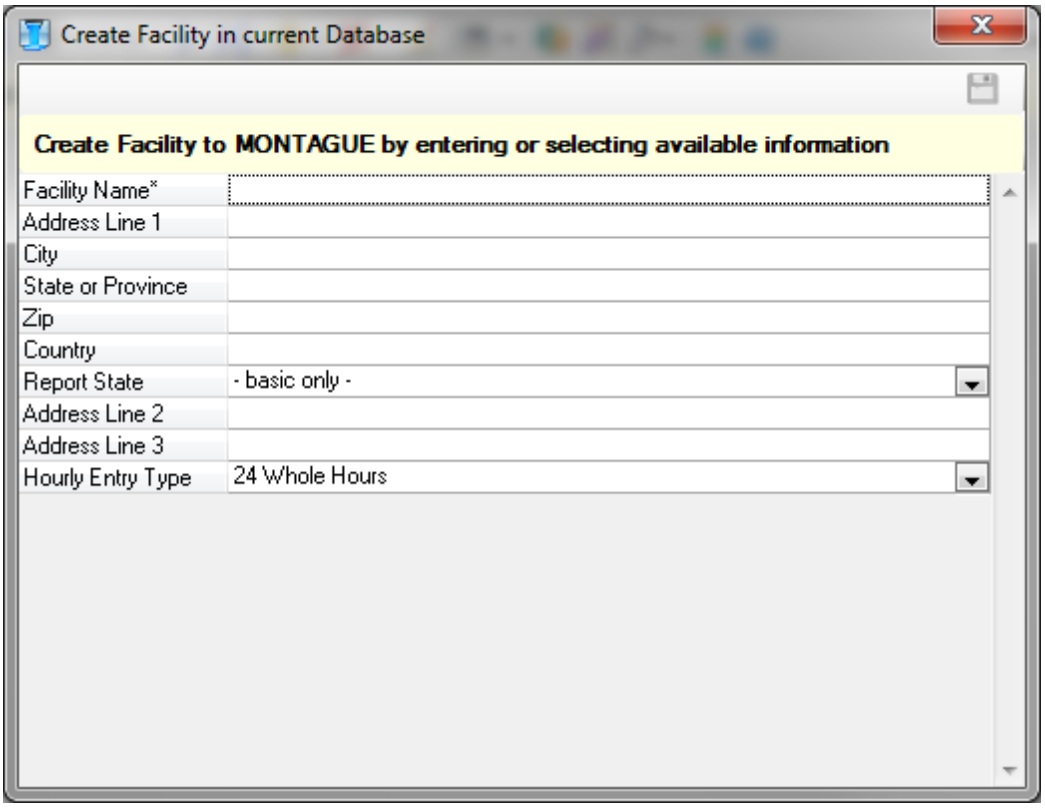

4.2.3 Delete Database

Delete Database

Databases can be deleted at any time by users with permission to perform this action.

To delete a **Database**, select a Facility belonging to a Database and click the arrow beside the **[Delete]** button to select **Delete Database**.

> ***WARNING:*** ALL Facilities belonging to the selected Database will be deleted from Operator10 and will no longer be available for use. Please ensure that you have selected the correct database before proceeding to the Delete Database option.

4.2.4 Delete Facility

Delete Facility

Facilities can be deleted at any time by users with permission to perform this action.

To delete a Facility, select a Facility from the list and click the button to remove the selected Facility.

> ***WARNING:*** ALL Facilities belonging to the selected Database will be deleted from

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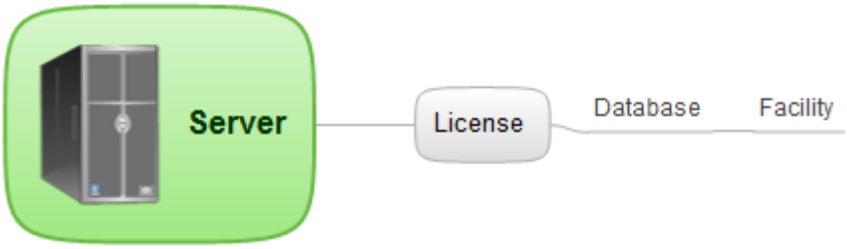
Operator10 and will no longer be available for use. Please ensure that you have selected the correct database before proceeding to the Delete Database option.

4.2.5 Database Structure

Operator10 - Wastewater Data Structure - Simple



Simple Data Structure (typical)

Server

Pervasive
Operator10 - Wastewater requires that the Pervasive.SQL database engine be installed. This engine should be installed as a service whenever possible. Consult with the Pervasive help topic to learn more about the Pervasive database engine and its features.

License

AllMax Software Product License(s)
Each AllMax Software product will install with a keycode that determines features and functionality of the application. Multiple instances of the same product may be present on a server, but each installed product is required to have a unique keycode/license as distributed by AllMax Software, Inc.

AllMax Software products include Operator10 - Wastewater® for Wastewater Data Management, Operator10 - Wastewater for Water Data Management, Antero™ Maintenance Data Management and Synexus Pretreatment Data Management.

Database

A database in Operator10 - Wastewater represents a collection of facilities and the associated information for each. Each database can contain one or many facilities. Certain information is shared between facilities within a database, most notably, Parameters.

Add/Create Database
See the Add New Database help topic for more information on database creation.

Open Database
See the Database help topic for more information on opening a database for use.

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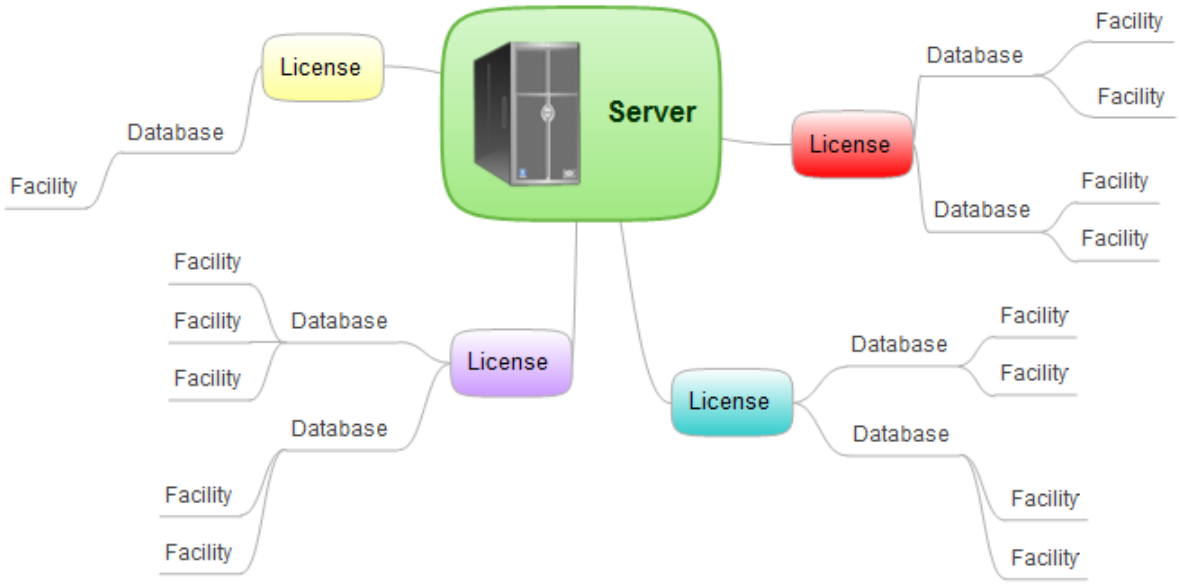
Operator10 - Wastewater Data Structure - Advanced



Advanced Data Structure

Diagram

The above diagram illustrates a hypothetical server which has four instances of Operator10 - Wastewater installed. Each instance can contain any number of databases, and each database can contain any number of facilities. Ultimately, these facilities serve as grouping mechanisms for the underlying data in the database.

Directory Structure

Each instance of Operator10 - Wastewater is installed to the target computer with the following directory structure:

```
\\[PC]\[TARGETDIR]\
    |
    ---Application\
    |       |
    |       ---lst\
    |       ---rpt_dll\
    |       ---lbl\
    |       ---manuals\
    |
    |
    ---Data\
           |
           ---License\
           ---SampleData
           ---[NAMED_DB]\
```

There are two main branches in this structure, Application and Data. The Application directory will be present in every installed instance of Operator10 - Wastewater, as this is where all application files, dependencies, and support files to the application are located. The Data directory will only be found on those machines that serve data to

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other machines. This Data directory has within it a minimum of three database directories. Two of these are installed by default: License and SampleData. In addition to these two stock databases, any number of user-created databases can exist. The first of these is created during the initial installation of Operator10 - Wastewater. Additional databases can be created from within the application.

NOTE: This directory structure is required in order for Operator10 - Wastewater to function properly, so it is highly recommended that no changes be made, such as renaming or rearranging the folder structure. Addition of user-created folders to the directory structure is generally acceptable. If you have a need to make changes, please contact AllMax Software Technical Support for more information.

NOTE: Not all users will have multiple licenses, databases or facilities. This drawing is only an example of the capabilities of the AllMax Software, Inc., Operator10 - Wastewater data structure in detail. For most users, assume one branch from the "server" with a single license, database and facility.

4.2.6 Database Properties

Database Properties

Database Properties can be set to determine calculation methods, constants, conversion values, fecal parameters and more for each database created as part of Operator10. The Database properties tab is part of the Database Utilities section and can be accessed by going to the **File** menu, selecting **Open Database...** and clicking the **[...]** button in the column Properties for a selected database.

Additionally, users can go to the **Help** ribbon and choose the **About** option to access the **Help | About** screen. From the Help | About screen, click the link for Database Properties.

WARNING: Settings found in the Database Properties section will override and overwrite settings or changes for duplicate entries found in the Configuration File.

WARNING: Operator10 does NOT allow changes to this section without appropriate User Security. Please contact AllMax Software for additional information.

Other Database Properties Functions

Additional functions are available in the Database Properties section. See the following links for additional information.

- Database Utilities - Rename
- Database Utilities - Table properties
- Database Utilities - Rebuild tables
- Database Utilities - Registry

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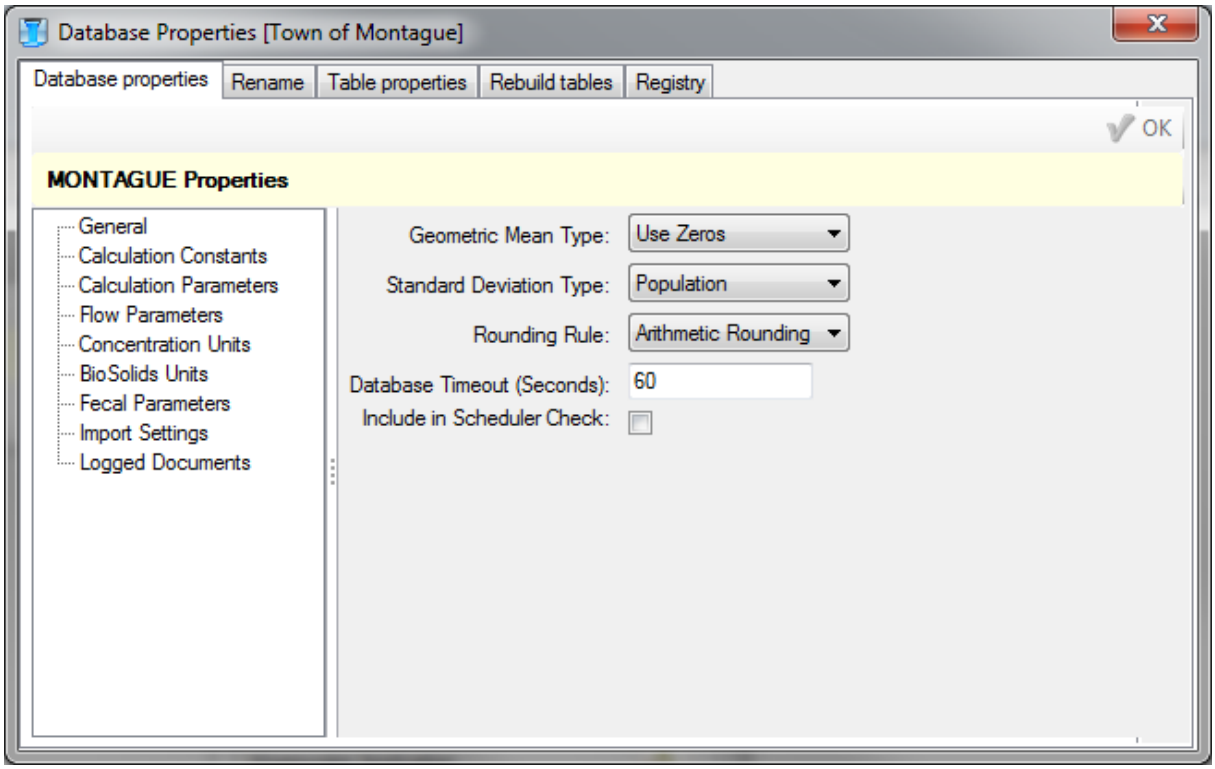

The following sections are available for editing in the **Database properties** tab. These sections are able to be selected on the left side of the **Database Properties** window (as shown above).

General

Geometric Mean Type: Choose from the following options to change the method by which Operator10 - Wastewater calculates geometric mean.

- **Use Zeros** - Any 0 values present in the data set will be used in the calculation of geometric mean
- **Treat Zeros as One** - Any 0 values present in the dataset will be seen as 1 and will be used will be in the calculation of geometric mean
- **Ignore Zeros** - Any 0 values present in the dataset will be ignored and will not be used in the calculation of geometric mean

Standard Deviation: Choose from the following options to change the method by which Operator10 - Wastewater calculates standard deviation.

- **Population** - Numerator = *n*
- **Sample** - Numerator = *n-1*

Rounding Rule: Choose from the following options to change the method by which Operator10 - Wastewater rounds calculated data.

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- **Arithmetic Rounding** - Values greater than 5 round up, otherwise it rounds down
- **Even Biased Rounding** - Values greater than 5 round up, exactly 5 rounds to nearest even value, otherwise it rounds down
- **Truncation** - Values are truncated rather than rounded
- **Significant Digits** - Values are rounded to the specified significant digit

Database Timeout (Seconds): Enter a number of seconds to allow for a response from the database before the operation times out.

Include in Scheduler Checks: Enable the checkbox for **Include in Scheduler Checks** to establish the connection between the current database and the Operator10 Agent to allow the database to be included in the processing of the scheduled imports, calculations and backups.

Calculation Constants

Build this list to define any constants to be used internally and by functions in the calculation of data. Click the **[Add]** button to begin. Enter the constant (8.34, 0.45359, pi, etc.) to be defined and its value.

Calculation Parameters

Define calculation parameters to aid in the calculation of process and internal formulas. Specific Gravity, Solids TSS, Solids % and Solids Vol % can be defined.

Flow Parameters

Use this list to define a set of flow parameters to be used in the conversion to MGD (million gallons per day). Click the **[Add]** button to begin. Select a Flow Parameter by clicking the **[...]** button and choosing from the parameter list. Enter a MGD multiplier to convert the selected parameter to MGD.

Concentration Units

Use this list to define a set of concentration units to be used in the conversion to MG/L (milligrams/liter). Click the **[Add]** button to begin. Enter a Concentration Unit and a mg/l multiplier that should be used to convert the unit to mg/l.

Bio Solids Units

Use this list to define a set of units to be used in the calculation of biosolids related data. Click the **[Add]** button to begin. Enter a BioSolids Unit and the mg/kg multiplier that should be used to convert the unit to MG/KG (milligrams/kilogram).

Fecal Parameters

Use this list to define parameters that should have any calculated average perform a calculation of geometric mean instead. This list would typically contain parameters

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such as Fecal Coliform, Total Coliform and E Coli. Any additional parameters may be added, click the **[Add]** button to select a parameter for inclusion in this list.

Import Settings

Use these fields to update default configuration of the ImportUtility.

- **Import files path:** - the path used by the ImportUtility to find and access files for importing; set this path by clicking the [...] button
- **Extension for import data files:** - the custom file extension used by the ImportUtility to seek out data import files (Examples: .txt, .csv, .imp, etc.)
- **Extension for import notes files:** - the custom file extension used by the ImportUtility to seek out notes import files (Examples: .note, .notes, .impnote, etc.)

Logged Documents

For the following sections of Operator10 - Wastewater, select the desired level of prompting for the Logged Documents feature.

DataView:

- **Never** - Never prompts user to log any printed documents
- **Always** - Does not prompt user, automatically logs all printed documents
- **Prompt** (default option) - Prompts for logging of printed documents

Graph:

- **Never** - Never prompts user to log any printed documents
- **Always** - Does not prompt user, automatically logs all printed documents
- **Prompt** (default option) - Prompts for logging of printed documents

Report:

- **Never** - Never prompts user to log any printed documents
- **Always** - Does not prompt user, automatically logs all printed documents
- **Prompt** (default option) - Prompts for logging of printed documents

Sampling:

- **Never** - Never prompts user to log any printed documents
- **Always** - Does not prompt user, automatically logs all printed documents
- **Prompt** (default option) - Prompts for logging of printed documents

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4.2.7 Database Utilities

From the Database Properties window, the following options are available as Database Utilities:

- Rename
- Table properties
- Rebuild tables
- Registry

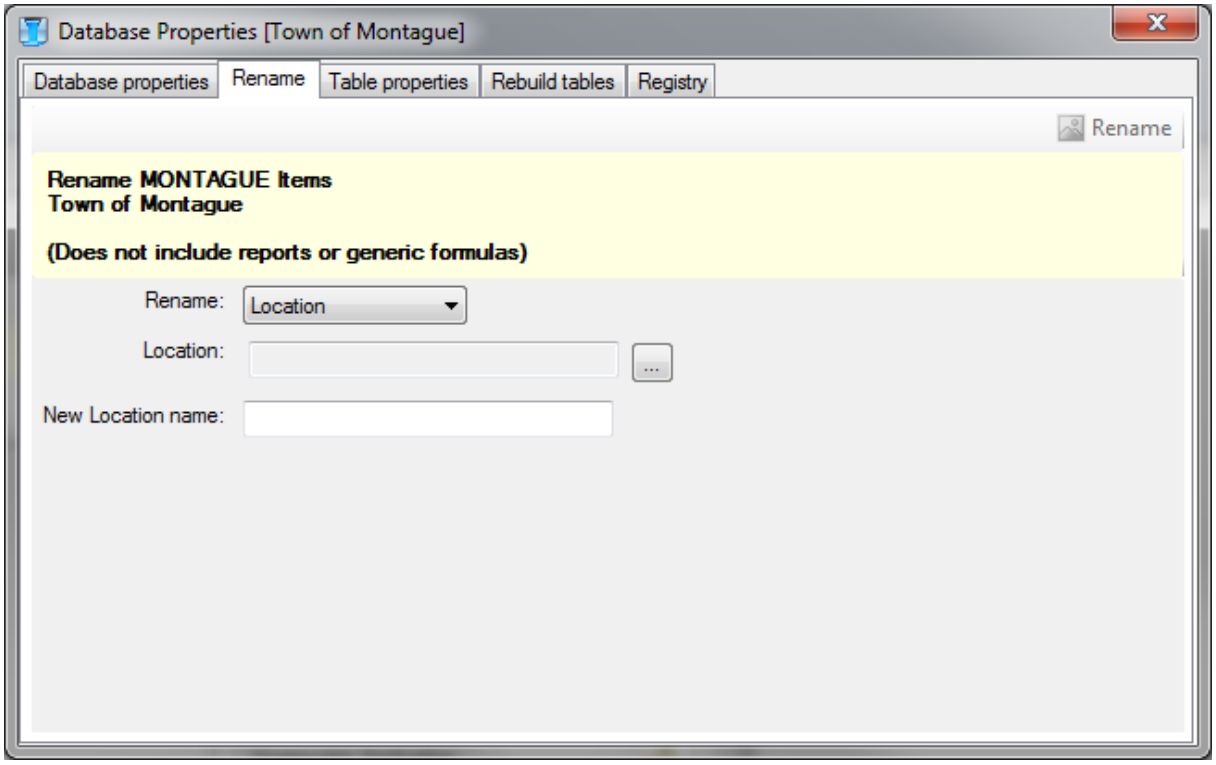
4.2.7.1 Database Utilities - Rename

Rename

The Rename utility allows users to rename specific items found in the Operator10 database. Users can rename Locations, Location:Parameters, Formulas, Facilities and Facility Directories. Due to the sensitive nature of these items, it is recommended that a backup be completed prior to performing any rename functions.

In most cases, the procedure to rename data is as follows:

1. Select the type of data to be renamed
2. Choose the item to be renamed, click the **[...]** button to select from an available list of items
3. Enter a new item name
4. Click the **[Rename]** button (located in the top-right) to complete the process



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4.2.7.2 Database Utilities - Table properties

Table properties

Information regarding the properties of data files used within the Operator10 database are provided in the Table Properties tab. Information presented in the grid is for information purposes only.

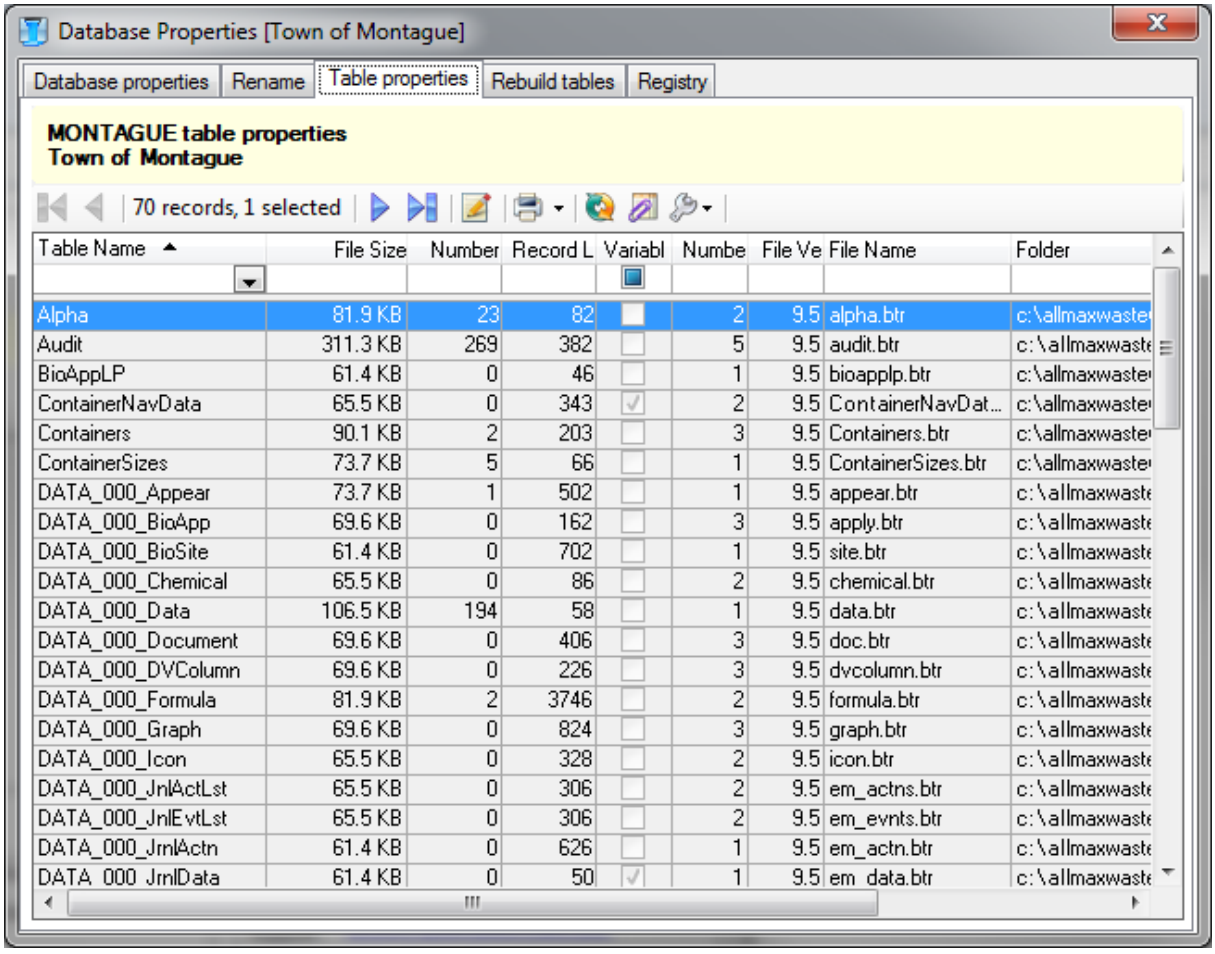

Table Name	File Size	Number	Record L	Variabl	Numbe	File Ve	File Name	Folder
Alpha	81.9 KB	23	82		2	9.5	alpha.btr	c:\allmaxwaste
Audit	311.3 KB	269	382		5	9.5	audit.btr	c:\allmaxwaste
BioAppLP	61.4 KB	0	46		1	9.5	bioapplp.btr	c:\allmaxwaste
ContainerNavData	65.5 KB	0	343	✓	2	9.5	ContainerNavDat...	c:\allmaxwaste
Containers	90.1 KB	2	203		3	9.5	Containers.btr	c:\allmaxwaste
ContainerSizes	73.7 KB	5	66		1	9.5	ContainerSizes.btr	c:\allmaxwaste
DATA_000_Appear	73.7 KB	1	502		1	9.5	appear.btr	c:\allmaxwaste
DATA_000_BioApp	69.6 KB	0	162		3	9.5	apply.btr	c:\allmaxwaste
DATA_000_BioSite	61.4 KB	0	702		1	9.5	site.btr	c:\allmaxwaste
DATA_000_Chemical	65.5 KB	0	86		2	9.5	chemical.btr	c:\allmaxwaste
DATA_000_Data	106.5 KB	194	58		1	9.5	data.btr	c:\allmaxwaste
DATA_000_Document	69.6 KB	0	406		3	9.5	doc.btr	c:\allmaxwaste
DATA_000_DVColumn	69.6 KB	0	226		3	9.5	dvcolumn.btr	c:\allmaxwaste
DATA_000_Formula	81.9 KB	2	3746		2	9.5	formula.btr	c:\allmaxwaste
DATA_000_Graph	69.6 KB	0	824		3	9.5	graph.btr	c:\allmaxwaste
DATA_000_Icon	65.5 KB	0	328		2	9.5	icon.btr	c:\allmaxwaste
DATA_000_JnlActLst	65.5 KB	0	306		2	9.5	em_actns.btr	c:\allmaxwaste
DATA_000_JnlEvtLst	65.5 KB	0	306		2	9.5	em_evnts.btr	c:\allmaxwaste
DATA_000_JrnlActn	61.4 KB	0	626		1	9.5	em_actn.btr	c:\allmaxwaste
DATA_000_JrnlData	61.4 KB	0	50	✓	1	9.5	em_data.btr	c:\allmaxwaste

4.2.7.3 Database Utilities - Rebuild

Rebuild tables

The Rebuild tables tab provides functionality allowing for the rebuilding of database files in the event of corruption or data failure. Many different rebuild options are presented and functionality presented within this tab should be performed only with technical support personnel.

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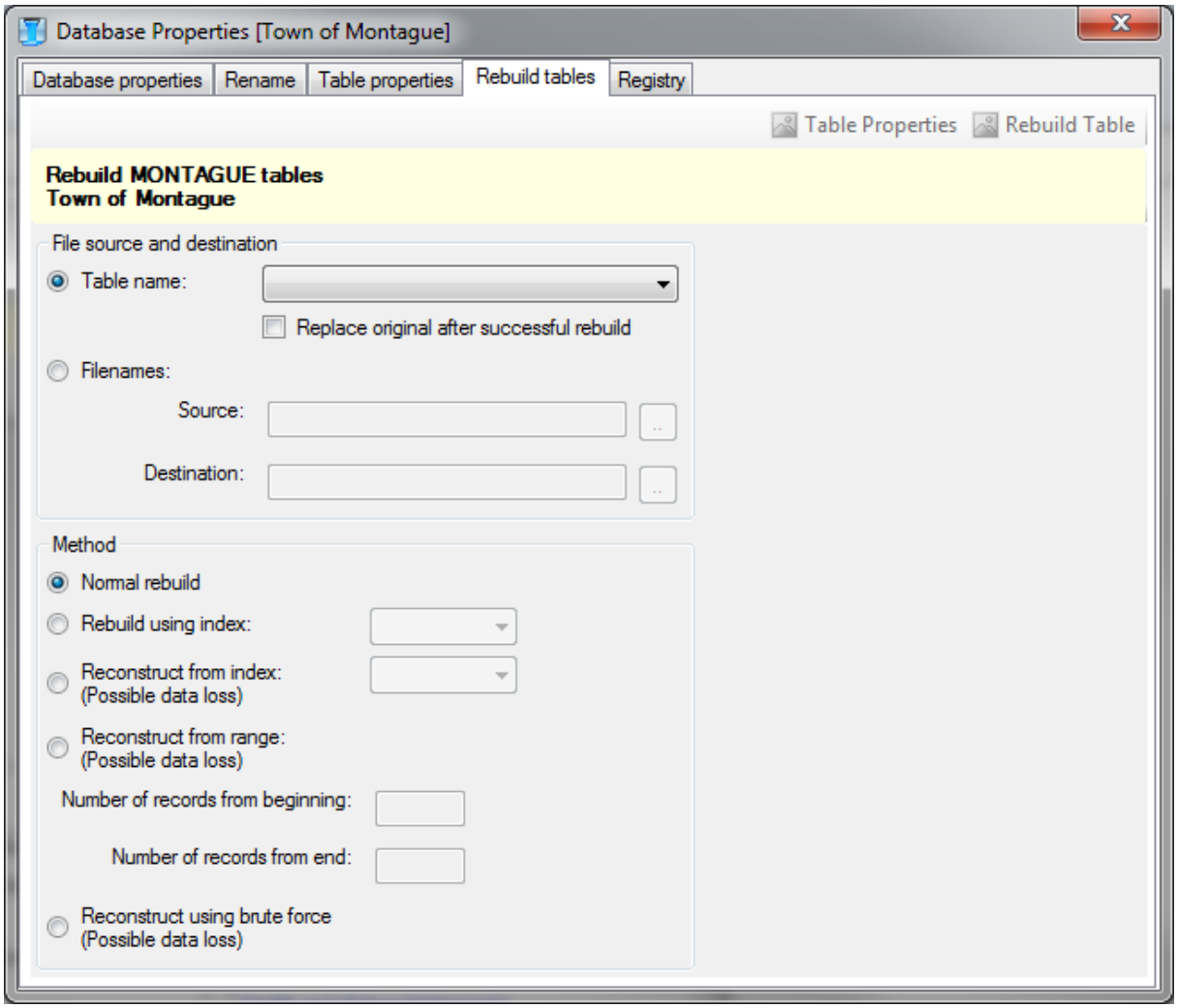

4.2.7.4 Database Utilities - Registry

Registry

For information purposes, Registry entries used by Operator10 software are presented in the Registry tab. Users can make changes to the Date, Month and Time formats if desired.

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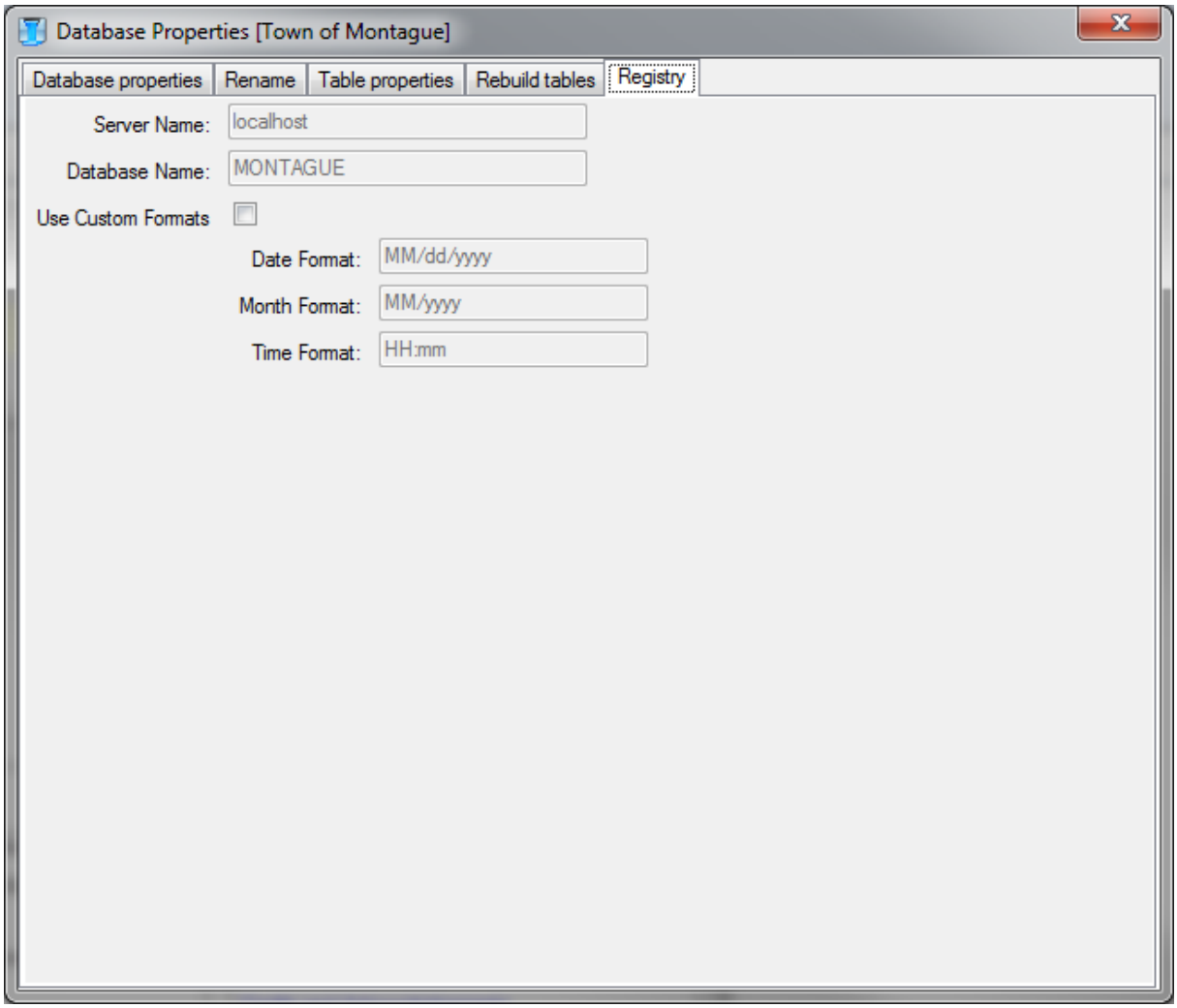

4.2.8 Pervasive

Pervasive PSQL v11, v10 and Btrieve

Internal database management is provided by Pervasive PSQL/Btrieve software, ©1992-2014 Pervasive Software, Inc.

For **Pervasive PSQL** products, included with your Operator10 installation are utilities provided by Pervasive and installed in the Pervasive directory (by default C:\Program Files \Pervasive Software\PSQL):

For **Pervasive.SQL 2000** products, included with your Operator10 installation are utilities provided by Pervasive and installed in the Pervasive directory (by default C:\PVSW\BIN):

PCC.EXE - **Pervasive Control Center** (Version Pervasive.SQL 2000) Pervasive Control Center includes complete utilities for configuration, troubleshooting, file management, and ODBC services.

Several of the utilities may also be run individually:
PCC.EXE - Pervasive System Analyzer

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PSAWIZRD.EXE - Pervasive System Analyzer
(found by default in C:\Program Files\Common Files\Pervasive Software)
PVLOCATE.EXE - GateWay Locator (WorkGroup Users)
W32MAINT.EXE - File Maintenance and Creation
W3MONV75.EXE - Monitor (Files and Users)
W32RBLD.EXE - File Rebuild Utility
W32UCADM.EXE - User Count Administrator
WBEXEC32.EXE - Function Executor

The ODBC Administrator (ODBCAD32.EXE) may also be found in the Windows System directory/folder, or run from the Windows Control Panel ODBC Data Sources (32bit) Icon.

For Pervasive **Version 6.x** products, included with your Operator10 installation are utilities provided by Pervasive and found in the Operator 10 directory/folder.

DBSETUP.EXE - edit BTI.INI settings (Version 6, Win3.1)
W32MKSET.EXE - edit registry settings (Version 6, Win95 or NT)
WBMANAGE.EXE - inspect data files (Version 6)

WARNING: Please contact AllMax for assistance before making any changes in Pervasive/Btrieve settings.

4.3 Facility

A **Facility** represents the Locations and Parameters that are sampled to meet water and wastewater treatment sampling requirements, internal process control and plant performance. A facility includes tools for data entry, review, graphing and reporting.

In terms of Operator10 - Wastewater database structure, a Facility is second in the hierarchy of the database. Facility is used to separate and maintain different lists of items, such as Locations, Location:Parameters, Formulas, Graphs and Reports. Facility can also be used to indicate Security settings and context.

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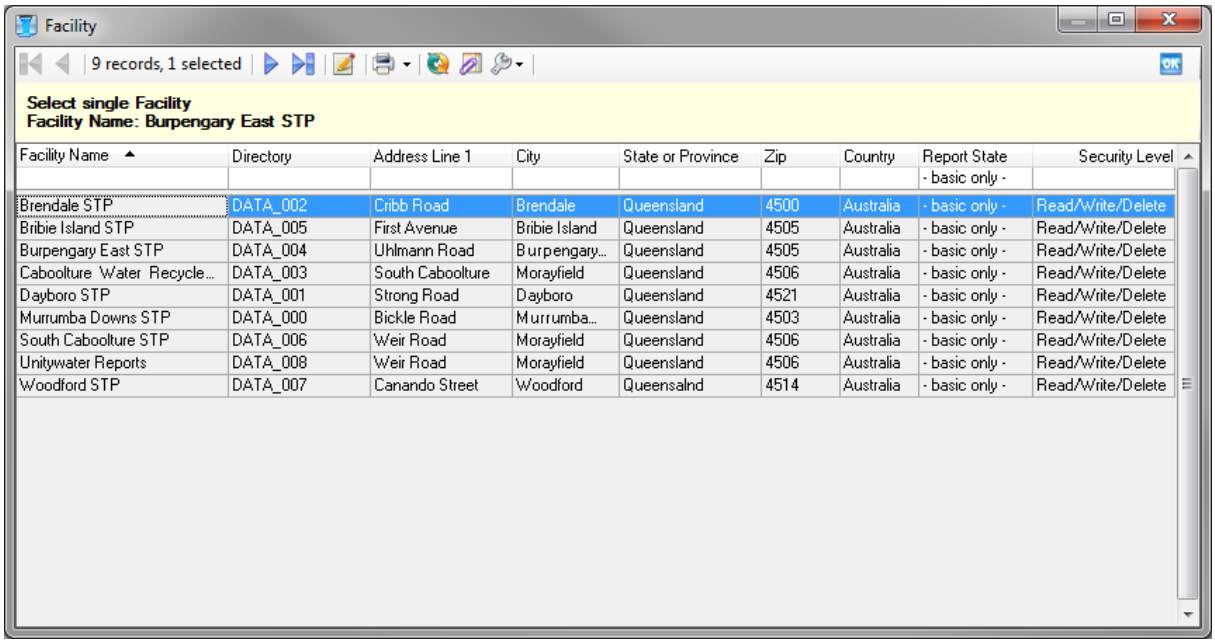

Facility Name	Directory	Address Line 1	City	State or Province	Zip	Country	Report State	Security Level
							- basic only -	
Brendale STP	DATA_002	Cribb Road	Brendale	Queensland	4500	Australia	- basic only -	Read/Write/Delete
Bribie Island STP	DATA_005	First Avenue	Bribie Island	Queensland	4505	Australia	- basic only -	Read/Write/Delete
Burpengary East STP	DATA_004	Uhlmann Road	Burpengary...	Queensland	4505	Australia	- basic only -	Read/Write/Delete
Caboolture Water Recycle...	DATA_003	South Caboolture	Morayfield	Queensland	4506	Australia	- basic only -	Read/Write/Delete
Dayboro STP	DATA_001	Strong Road	Dayboro	Queensland	4521	Australia	- basic only -	Read/Write/Delete
Murrumba Downs STP	DATA_000	Bickle Road	Murrumba...	Queensland	4503	Australia	- basic only -	Read/Write/Delete
South Caboolture STP	DATA_006	Weir Road	Morayfield	Queensland	4506	Australia	- basic only -	Read/Write/Delete
Unitywater Reports	DATA_008	Weir Road	Morayfield	Queensland	4506	Australia	- basic only -	Read/Write/Delete
Woodford STP	DATA_007	Canando Street	Woodford	Queensalnd	4514	Australia	- basic only -	Read/Write/Delete

Accessing Facility List

To access the list of Facilities, go to the **File** menu and choose **Change Facility...**. This will display the Facility list (seen above) and will allow users to change facilities.

Creating a New Facility

To create a new facility, go to the **File** menu and choose **Open Database...** to begin. See the Add New Facility topic for more information.

Deleting a Facility

To delete a facility, go to the **File** menu and choose **Open Database...** to begin. See the Delete Facility topic for more information.

4.4 Location

A **Location** can be used to describe a point in a facility, physical or logical, where Parameters are located, such as Plant Influent, Effluent, Aeration Tank, etc. At each location, parameters, specific tests or data points, can be added depending on the type of data to be stored: BOD, TSS, VSS, Ammonia, Flow, etc. A standard naming list of commonly used naming conventions for a Wastewater treatment plant is included to choose from or user defined names can be created.

Examples: Raw Influent:Flow MGD = "Flow MGD" Parameter at the "Raw Influent" Location
Effluent:BOD 5= "BOD 5" (BOD 5 Day MG/L) Parameter at the "Effluent" Location

Accessing Location List

To access the **Location** list, in the Operator10 - Wastewater Main Application, go to

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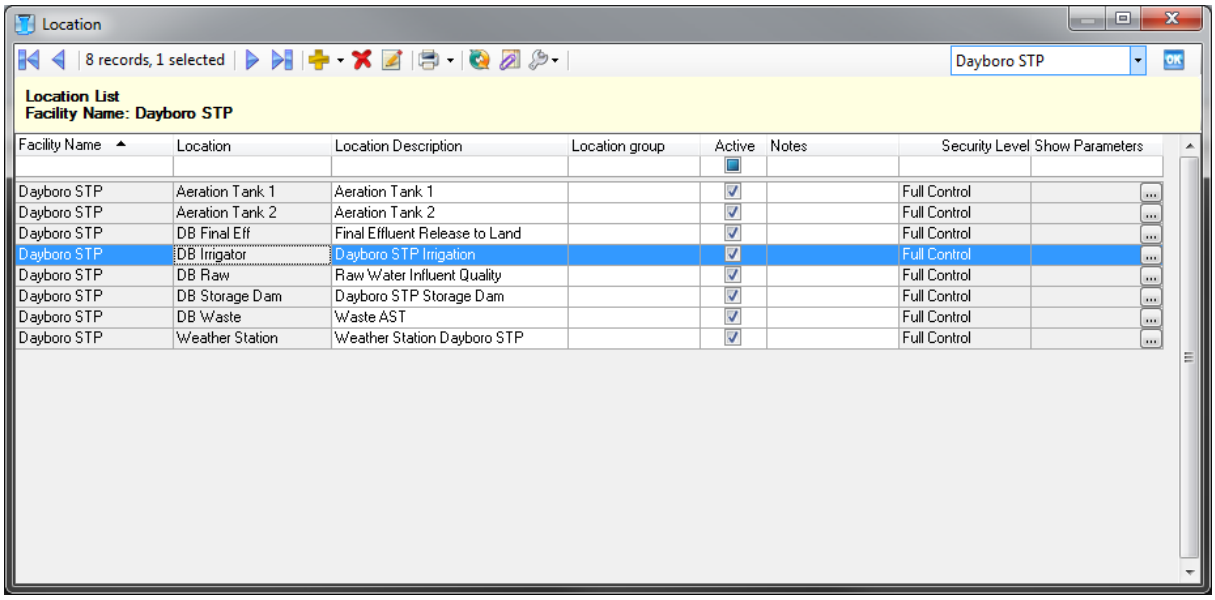
the **Setup** ribbon, click the **Locations** button.


Location
8 records, 1 selected
Dayboro STP
OK
Location List
Facility Name: Dayboro STP
Facility Name
Location
Location Description
Location group
Active
Notes
Security Level
Show Parameters
Dayboro STP Aeration Tank 1 Aeration Tank 1 Full Control
Dayboro STP Aeration Tank 2 Aeration Tank 2 Full Control
Dayboro STP DB Final Eff Final Effluent Release to Land Full Control
Dayboro STP DB Irrigator Dayboro STP Irrigation Full Control
Dayboro STP DB Raw Raw Water Influent Quality Full Control
Dayboro STP DB Storage Dam Dayboro STP Storage Dam Full Control
Dayboro STP DB Waste Waste AST Full Control
Dayboro STP Weather Station Weather Station Dayboro STP Full Control

Location List Functionality

The Location list and Location editor window have the general properties of the Grid and Grid Edit windows. (For more information about these sections, please see the topic: Grid Functionality).

In the Location List, users can:

- Add Location
- Delete Location

Add/Assign Parameters

Parameters, tests or samples collected at the respective Location, can be added to the Location.

Using the **[Add]** button secondary menu (the drop-down menu arrow or split button), select the option **Add Parameters** or from the Location list, click the **[...]** button that appears in the column titled "Show Parameters" to begin adding parameters to a selected location.

In the **Assigned Parameter** list that appears, users can begin to add parameters to the list as needed. Click the **[Add]** button to begin adding parameters.

Once selected, Location:Parameter information can be edited. In-grid editing is possible by entering data where permitted. Multiple-record editing is also permitted.

Highlight a group of records to be edited together and click the **[Edit]** button to

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begin editing.

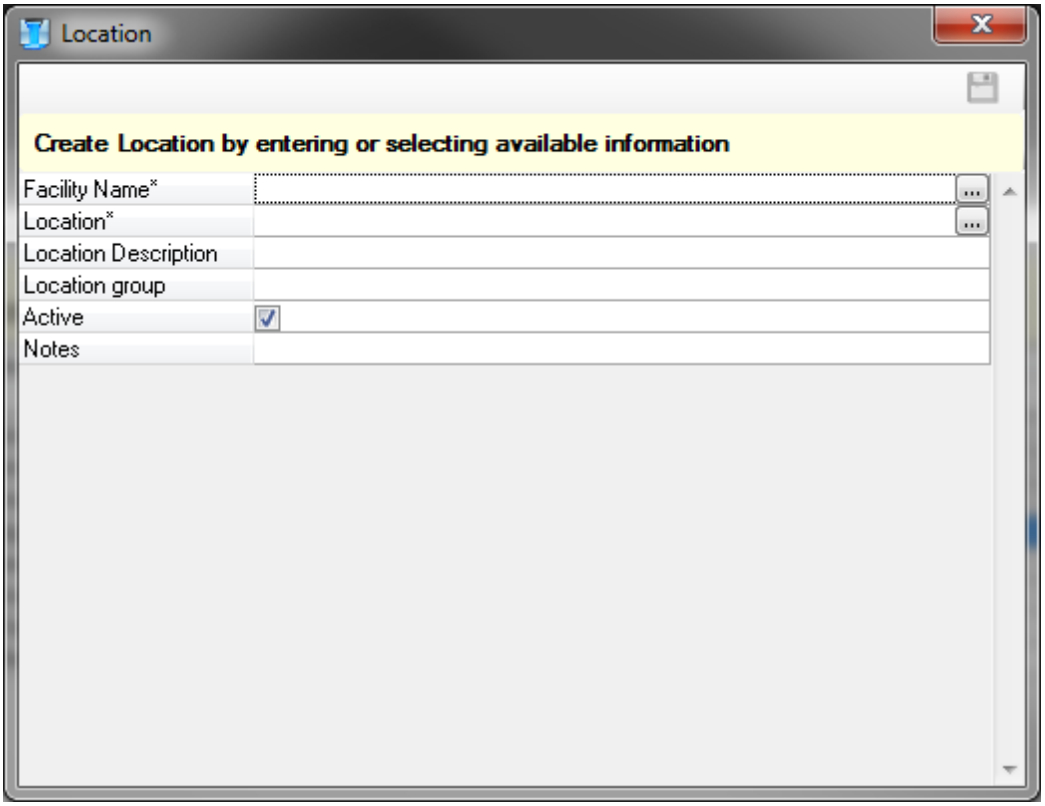
Items able to be edited include: **Upper Limit**, **Lower Limit**, **Formula**, **Entry Type** and **Editable**. For more information, see Location:Parameter.

4.4.1 Add Location

Add New Location

To add a new location to the list, users should click the **[Add]** button to begin.

1. Users will be presented with a Location window that will allow for data entry of required and optional information. (See below)
2. Enter a unique **Location** (1 to 16 characters) to identify the Location. A Description (0 to 30 characters) may also be entered.
    a. **Standard Locations** can be added from an existing list of Locations created and managed by AllMax utilizing standard naming conventions and suggestions based on industry standards. Click the **[...]** button to view the list of Standard Locations.
3. Check the **[ ]In Service** checkbox for Locations/Sampling Points which are currently in use.
4. **Notes** can be entered for a Location, enter text directly into the Notes field.
5. Click the **[Save]** button to save any data entered.



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Add Similar Location

From the Location list, users are able to create similar locations if one exists. To utilize this feature, highlight an existing Location in the list and click the arrow icon beside the **Add** button to select **Add Similar Location**.

> ***NOTE:*** The Location list and Location editor window have the general properties of the Grid and Grid Edit windows. (For more information about these sections, please see the topic: Grid Functionality).

4.4.2 Delete Location

Delete Location

Locations can be deleted from the database, click the **[Delete]** button to delete records. Individually selected records can be deleted as well as multiple selections of locations. Confirmation is required when deleting locations from the database. Click the Yes **[Yes]** button to confirm or No **[No]** to cancel the deletion of data.

> ***WARNING:*** All information associated with the selected record(s) will be deleted upon confirmation of the deletion. This is permanent and cannot be undone.

4.4.3 Standard Location

Standard Location

The **Standard Location** list displays a list of locations as defined by AllMax that represent possible locations for use in the Operator10 - Wastewater application. Additionally, when users of a database create new locations, those locations are also added to the list to aid in future setup and Location:Parameter definitions.

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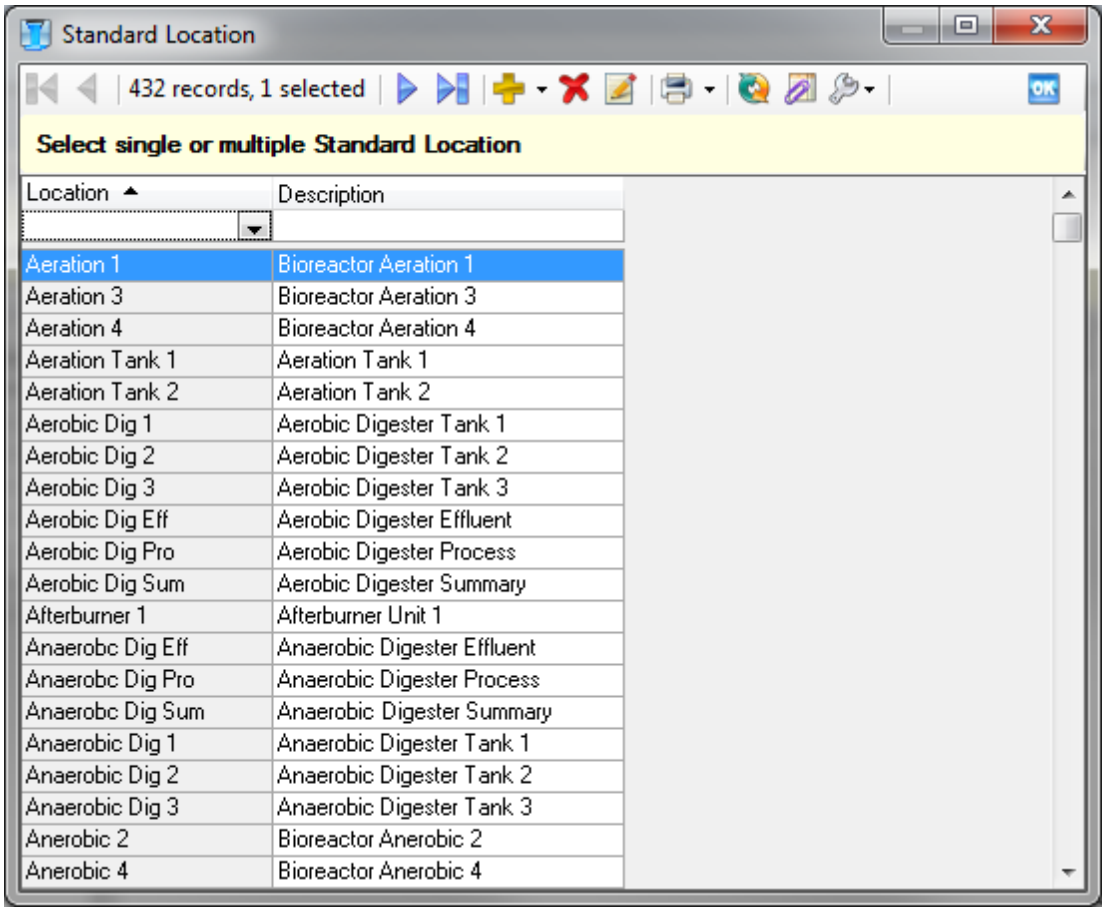
Standard Location
432 records, 1 selected
OK
Select single or multiple Standard Location
Location
Description
Aeration 1 Bioreactor Aeration 1
Aeration 3 Bioreactor Aeration 3
Aeration 4 Bioreactor Aeration 4
Aeration Tank 1 Aeration Tank 1
Aeration Tank 2 Aeration Tank 2
Aerobic Dig 1 Aerobic Digester Tank 1
Aerobic Dig 2 Aerobic Digester Tank 2
Aerobic Dig 3 Aerobic Digester Tank 3
Aerobic Dig Eff Aerobic Digester Effluent
Aerobic Dig Pro Aerobic Digester Process
Aerobic Dig Sum Aerobic Digester Summary
Afterburner 1 Afterburner Unit 1
Anaerobc Dig Eff Anaerobic Digester Effluent
Anaerobc Dig Pro Anaerobic Digester Process
Anaerobc Dig Sum Anaerobic Digester Summary
Anaerobic Dig 1 Anaerobic Digester Tank 1
Anaerobic Dig 2 Anaerobic Digester Tank 2
Anaerobic Dig 3 Anaerobic Digester Tank 3
Anerobic 2 Bioreactor Anerobic 2
Anerobic 4 Bioreactor Anerobic 4

4.5 Parameter

Parameters are associated with Locations so that the Data can be stored. These Parameters can be chosen from the Parameter List, which consists of calculated parameters, USEPA defined parameters, or user-defined parameters. Selected Parameters are linked to a specific Location.

Examples: Raw Influent:Flow MGD = "Flow MGD" Parameter at the "Raw Influent" Location Effluent:BOD 5= "BOD 5" (BOD 5 Day MG/L) Parameter at the "Effluent" Location

The **Parameter List** consists of calculated parameters, US EPA defined parameters, or user-defined parameters. Selected Parameters are linked to a specific Location, forming a Location:Parameter. For increased efficiency, Parameters found in the Parameter List are shared between all facilities.

Accessing the Parameter List

The **Parameter List** is accessed most often when coming from the creation of a new Location:Parameter. When creating a new Location:Parameter, the **[...]** button is available in the Parameter field, use this button to open the Parameter List.

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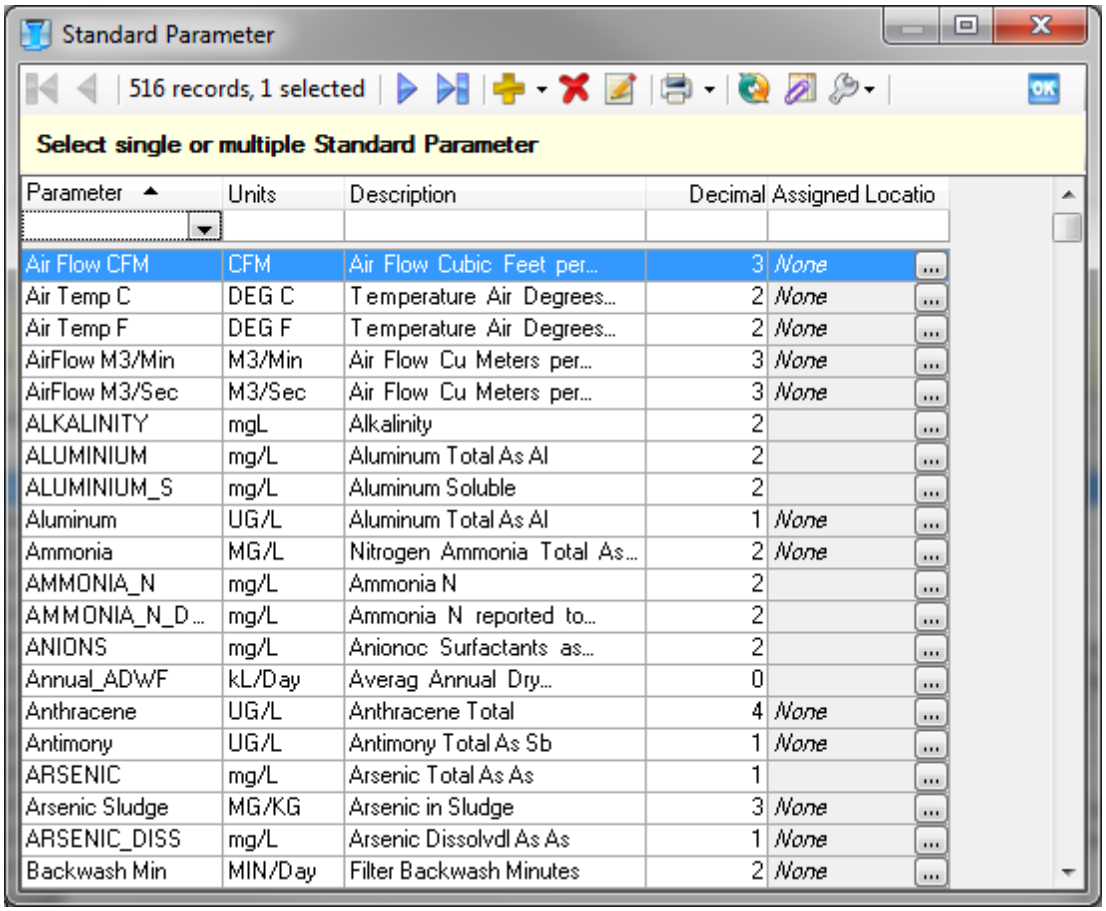

Parameter	Units	Description	Decimal	Assigned Locatio
Air Flow CFM	CFM	Air Flow Cubic Feet per...	3	None
Air Temp C	DEG C	Temperature Air Degrees...	2	None
Air Temp F	DEG F	Temperature Air Degrees...	2	None
AirFlow M3/Min	M3/Min	Air Flow Cu Meters per...	3	None
AirFlow M3/Sec	M3/Sec	Air Flow Cu Meters per...	3	None
ALKALINITY	mgL	Alkalinity	2	
ALUMINIUM	mg/L	Aluminum Total As Al	2	
ALUMINIUM_S	mg/L	Aluminum Soluble	2	
Aluminum	UG/L	Aluminum Total As Al	1	None
Ammonia	MG/L	Nitrogen Ammonia Total As...	2	None
AMMONIA_N	mg/L	Ammonia N	2	
AMMONIA_N_D...	mg/L	Ammonia N reported to...	2	
ANIONS	mg/L	Anionoc Surfactants as...	2	
Annual_ADWF	kL/Day	Averag Annual Dry...	0	
Anthracene	UG/L	Anthracene Total	4	None
Antimony	UG/L	Antimony Total As Sb	1	None
ARSENIC	mg/L	Arsenic Total As As	1	
Arsenic Sludge	MG/KG	Arsenic in Sludge	3	None
ARSENIC_DISS	mg/L	Arsenic Dissolvdl As As	1	None
Backwash Min	MIN/Day	Filter Backwash Minutes	2	None

Parameter List Functionality

The Parameter list and Parameter editor window have the general properties of the Grid and Grid Edit windows. (For more information about these sections, please see the topic: Grid Functionality).

In the Parameter List, users can:

- Add Parameter
- Delete Parameter

Add/Assign Location

Locations can be assigned to Parameters.

From the Parameter list, click the **[...]** button that appears in the column titled "Assigned Locations" to begin adding the selected parameter to select locations.

In the **Assigned Location** list that appears, users can begin to add locations to the list as needed. Click the **[Add]** button to begin adding locations.

Once selected, Location:Parameter information can be edited. In-grid editing is

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possible by entering data where permitted. Multiple-record editing is also permitted.

Highlight a group of records to be edited together and click the **[Edit]** button to begin editing.

Items able to be edited include: **Upper Limit**, **Lower Limit**, **Formula**, **Entry Type** and **Editable**. For more information, see Location:Parameter.

4.5.1 Add Parameter

Add New Parameter

To create a new parameter, click the **[Add]** button.

1. In the Parameter window that appears, (see image below)
2. Enter a unique **Parameter** name or number (1 to 14 characters) in the Parameter field.
    a. To view a list of Stock Parameters based on US EPA **STO**rage and **RET**rieval codes (**STORET**) and **C**hemical **A**bstracts **S**ervice (**CAS**) numbers, press the **[...]** button. Users can add parameters from the list by selecting and clicking the **[OK]** button. (see also: Parameter/STORET List)
3. Enter or select the **Units** of measurement (1 to 16 characters). Units can be chosen from the drop-down list box (Press the [...] button to display the selection list).
4. Enter a **Description** (0 to 30 characters) to further identify the Parameter in the **Description** field.
5. Enter the number of **Decimal Places** normally required for this Parameter. This value becomes the default number of decimal places for setup of DataViews and reports.

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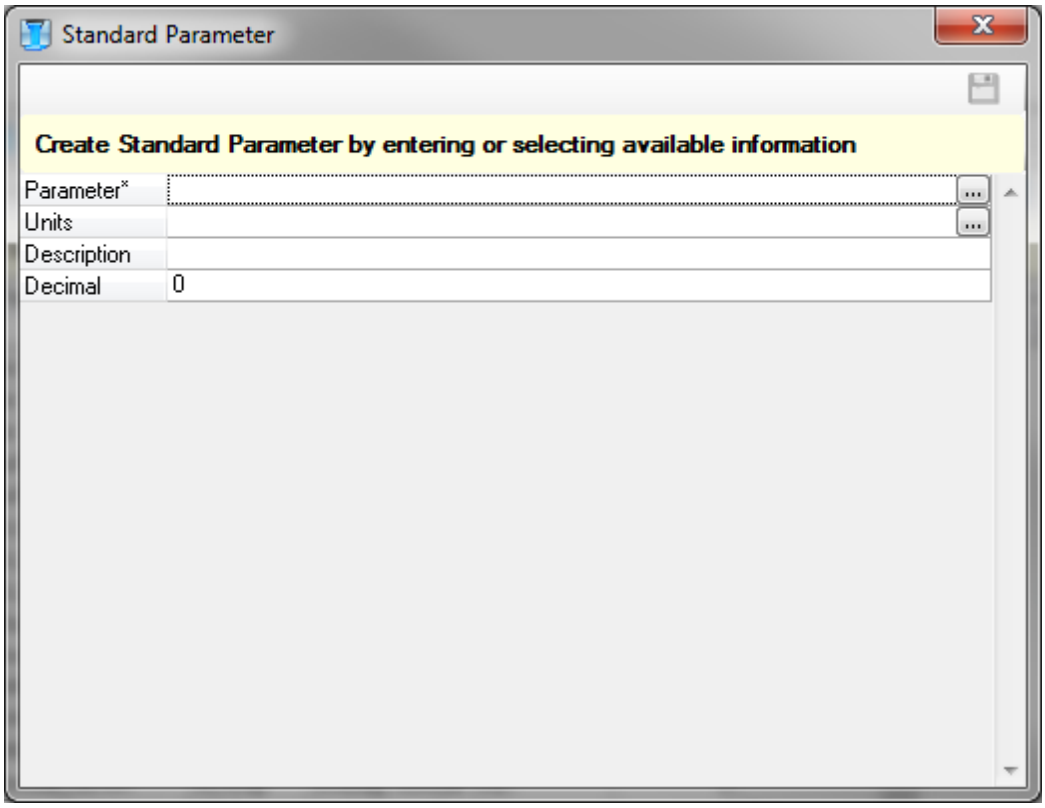

Add Similar Parameter

From the Parameter list, users are able to create similar parameters if one exists. To utilize this feature, highlight an existing Parameter in the list and click the arrow icon beside the **Add** button to select **Add Similar Parameter**.

NOTE: The Parameter list and Parameter editor window have the general properties of the Grid and Grid Edit windows. (For more information about these sections, please see the topic: Grid Functionality).

4.5.2 Delete Parameter

Delete Parameter

Parameters can be deleted from the database, click the **[Delete]** button to delete records. Individually selected records can be deleted as well as multiple selections of Parameters. Confirmation is required when deleting Parameters from the database. Click the Yes **[Yes]** button to confirm or No **[No]** to cancel the deletion of data.

WARNING: All information associated with the selected record(s) will be deleted upon confirmation of the deletion. This is permanent and cannot be undone.

4.5.3 Stock Parameters

Stock Parameters

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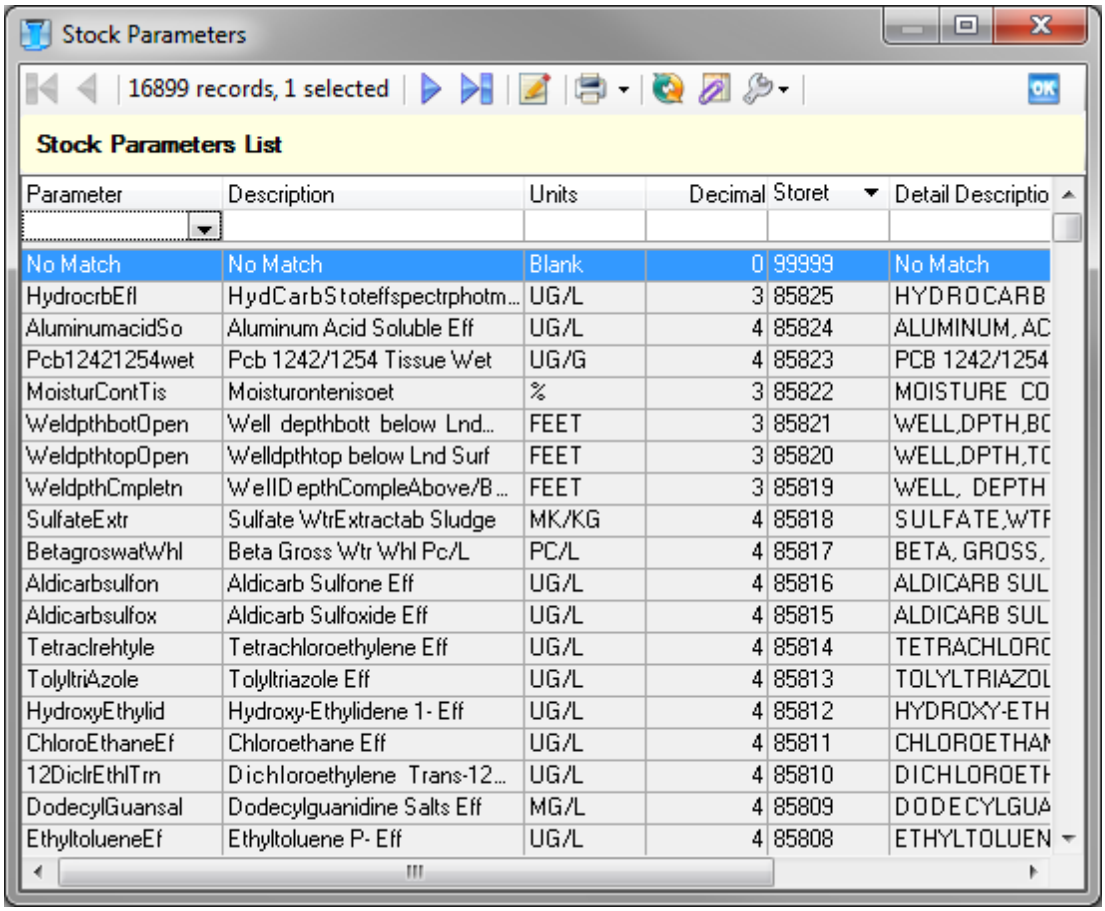
Over **16,000** US EPA **STO**rage and **RET**reval (**STORET**) Codes and abbreviated **C**hemical **A**bstracts **S**ervice (**CAS**) numbers are available when adding a new Parameter to the Parameter List.

To **sort** the Parameters by either **Code**, **Description**, or **Detail Description**, left-click the column header.

Select a Parameter and click the **[OK]** button to add the parameter to the Parameter List.



4.6 Location:Parameter

A **Location:Parameter** (or BioSolids **BioSolid:Parameter** or **Site:Parameter**) represents a capacity for data storage, calculation, or retrieval.

A Location describes a point in a facility, physical or logical, where Parameters are located. A Parameter can be chosen from the Parameter List, which consists of calculated parameters, USEPA defined parameters, or user-defined parameters. Selected Parameters are linked to a specific Location, forming a Location:Parameter.

Examples:

Raw Influent:Flow MGD = "Flow MGD" Parameter at the "Raw Influent" Location
Effluent:BOD 5= "BOD 5" (BOD 5 Day MG/L) Parameter at the "Effluent" Location

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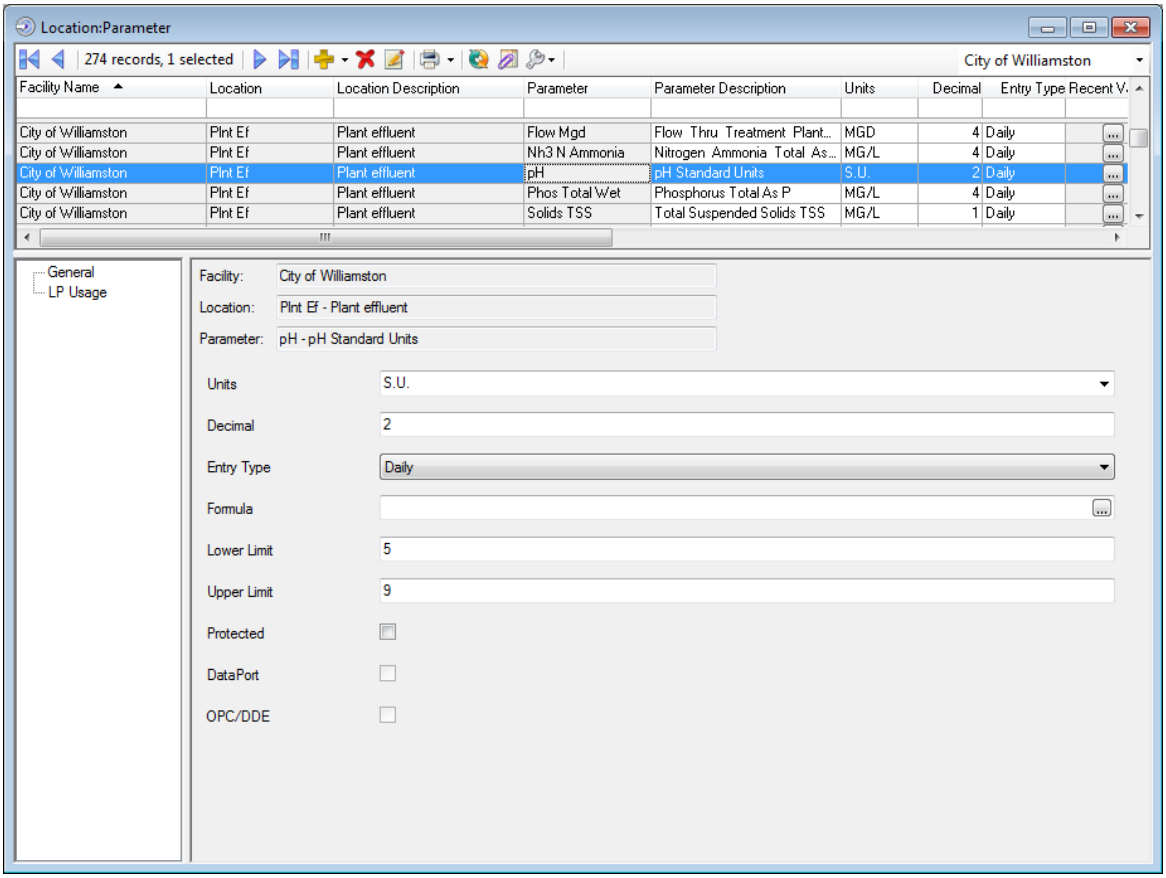
NOTE: The Location:Parameter list and Location:Parameter editor window have the general properties of the Grid and Grid Edit windows. (For more information about these sections, please see the topic: Grid Functionality).

Accessing Location:Parameter

To access Location:Parameter in Operator10 - Wastewater, in the Setup ribbon, click the **[L:Ps (Location:Parameters)]** button.


Location:Parameter
274 records, 1 selected
City of Williamston
Facility Name
Location
Location Description
Parameter
Parameter Description
Units
Decimal
Entry Type
Recent V.
City of Williamston Plnt Ef Plant effluent Flow Mgd Flow Thru Treatment Plant... MGD 4 Daily
City of Williamston Plnt Ef Plant effluent Nh3 N Ammonia Nitrogen Ammonia Total As... MG/L 4 Daily
City of Williamston Plnt Ef Plant effluent pH pH Standard Units S.U. 2 Daily
City of Williamston Plnt Ef Plant effluent Phos Total Wet Phosphorus Total As P MG/L 4 Daily
City of Williamston Plnt Ef Plant effluent Solids TSS Total Suspended Solids TSS MG/L 1 Daily
General
LP Usage
Facility: City of Williamston
Location: Plnt Ef - Plant effluent
Parameter: pH - pH Standard Units
Units S.U.
Decimal 2
Entry Type Daily
Formula
Lower Limit 5
Upper Limit 9
Protected
DataPort
OPC/DDE

The Location:Parameter form uses a List and Detail display to provide information about individual Location:Parameters. General information is available as well as Usage infotmation.

Location:Parameter Section Functionality

In the Location:Parameter section, functionality includes the ability to create new L:Ps, edit existing L:Ps and delete L:Ps. The list/detail presentation of data allows users to work with items through the List grid (displayed in the top-portion of the L:P section) and the Detail section (displayed in the lower-portion of the window). Data entered via the List or Detail section is saved immediately to the database and changes will be reflected as data is entered.

Location:Parameter Usage

To view Location:Parameter Usage information, choose the LP Usage tree item displayed at the left of the Location:Parameter window.

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Location:Parameter Properties

Location:Parameters have several available fields that allow users to determine the data entry method, calculation and data entry limits.

- **Units**: Enter or select units from the available list of common units
- **Decimal**: Enter the default number of places following the decimal to be displayed as a default (decimal precision can be set individually in other sections as desired).
- **Entry Type**: Data entry can be either **Daily** or **Hourly**. Choose from the following options to determine the appropriate data entry type:
  - **Daily**: Select Daily to allow for daily data entry
  - **Hourly non-sum**: Select Hourly non-sum to allow for hourly data entry with no daily summary
  - **Hourly avg**: Select Hourly avg to allow for hourly data entry with a daily summary of average
  - **Hourly max**: Select Hourly max to allow for hourly data entry with a daily summary of maximum
  - **Hourly min**: Select Hourly min to allow for hourly data entry with a daily summary of minimum
  - **Hourly sum**: Select Hourly sum to allow for hourly data entry with a daily summary of sum
  - **Hourly count**: Select Hourly count to allow for hourly data entry with a daily summary of the count of entries per day
- **Formula**: Select a formula for the Location:Parameter by clicking the [...] button. A formula list will be shown, choose a formula to be attached and used in the calculation of the Location:Parameter.
- **Lower Limit**: Enter a lower data entry limit to be warned if unexpected values are entered in the DataView. Additionally, for data entered via other methods, the text color of the entry, should it be below the Lower Limit, will be red.
- **Upper Limit**: Enter a upper data entry limit to be warned if unexpected values are entered in the DataView. Additionally, for data entered via other methods, the text color of the entry, should it be above the Upper Limit, will be red.
- **Protected**: If the Location:Parameter should not have data entry capabilities, uncheck this option.

Click the **[...]** button in the **Recent Value** column to review data for the selected Location:Parameter.

The **DataPort** column (display only) is marked if the values are selected to be entered using the DataPort handheld unit.

The **OPC/DDE** column (display only) is marked if the values are selected to be automatically entered via the OPC/DDE Interface Application.

The **Historian** column (display only) is marked if the values are selected to be automatically entered via one of the available Historian Interface Applications.

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4.6.1 Add Location:Parameter

Add a Location:Parameter

To add a new Location:Parameter to the list, click the **[Add]** button to begin. In the Location:Parameter edit window that opens, see below, enter the following information:

1. **Facility Name**: The Facility name is required, press the **[...]** button to select a Facility from the list, click the **[OK]** button to continue
2. **Location**: Enter (or select using the **[...]** button to see a list of Standard Locations) a Location name
3. **Location Description**: For new Locations, enter a Location Description to further describe the new Location
4. **Parameter**: Select parameters from the Parameter List, click the **[...]** button to see the Parameter list, click the **[OK]** button to continue
5. **Units**: Enter the unit of measurement for the selected Location:Parameter or choose from the drop-down menu
6. **Decimal**: Enter the desired, default number of decimal places to be displayed
7. **Entry Type**: Select the data entry type for the Location:Parameter (for more information see the Location:Parameter Entry topic)
8. **Lower Limit**: Enter the lower data entry limit for the Location:Parameter (warnings will be displayed when values exceed the entered limit value)
9. **Upper Limit**: Enter the upper data entry limit for the Location:Parameter (warnings will be displayed when values exceed the entered limit value)
10. **Formula**: If the Location:Parameter is to be calculated, select the desired formula from the Formula List, click the **[...]** button to view and select from the list of available Formulas
11. **Protected**: Check the checkbox for **Protected** if the Location:Parameter should not allow for data entry

Click the **[Save]** button to create the new Location:Parameter.

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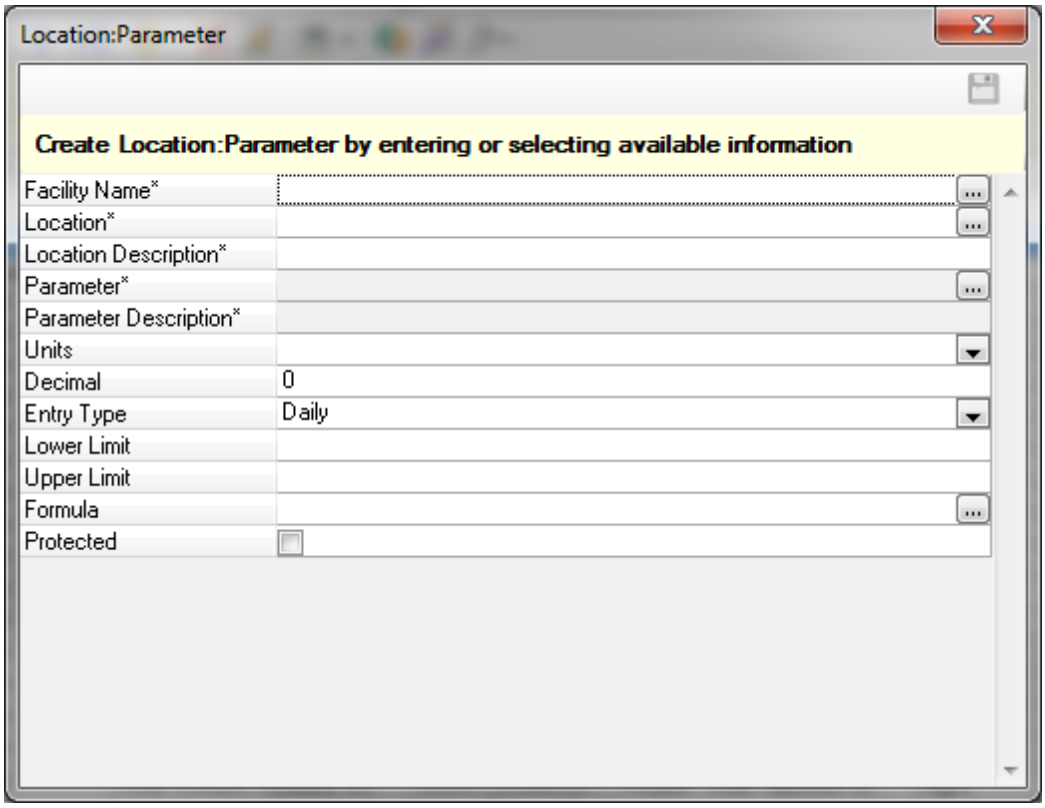

4.6.2 Delete Location:Parameter

Delete Location:Parameter

Location:Parameters can be deleted from the database, click the **[Delete]** button to delete records. Individually selected records can be deleted as well as multiple selections of location:parameters. Confirmation is required when deleting location:parameters from the database. Click the Yes **[Yes]** button to confirm or No **[No]** to cancel the deletion of data.

> ***WARNING:*** All information associated with the selected record(s) will be deleted upon confirmation of the deletion. This is permanent and cannot be undone.

4.6.3 Location:Parameter Usage

Location:Parameter Usage information is available from the Detail section. First select a Location:Parameter from the list grid at the top of the Location:Parameter section, next select the tree item, **LP Usage** to view Location:Parameter Usage information.

> ***NOTE:*** Depending on the selected Location:Parameter, the length of time to display usage information may vary. For Location:Parameters with extensive data history, the progress bar will be visible until all associated information is gathered.

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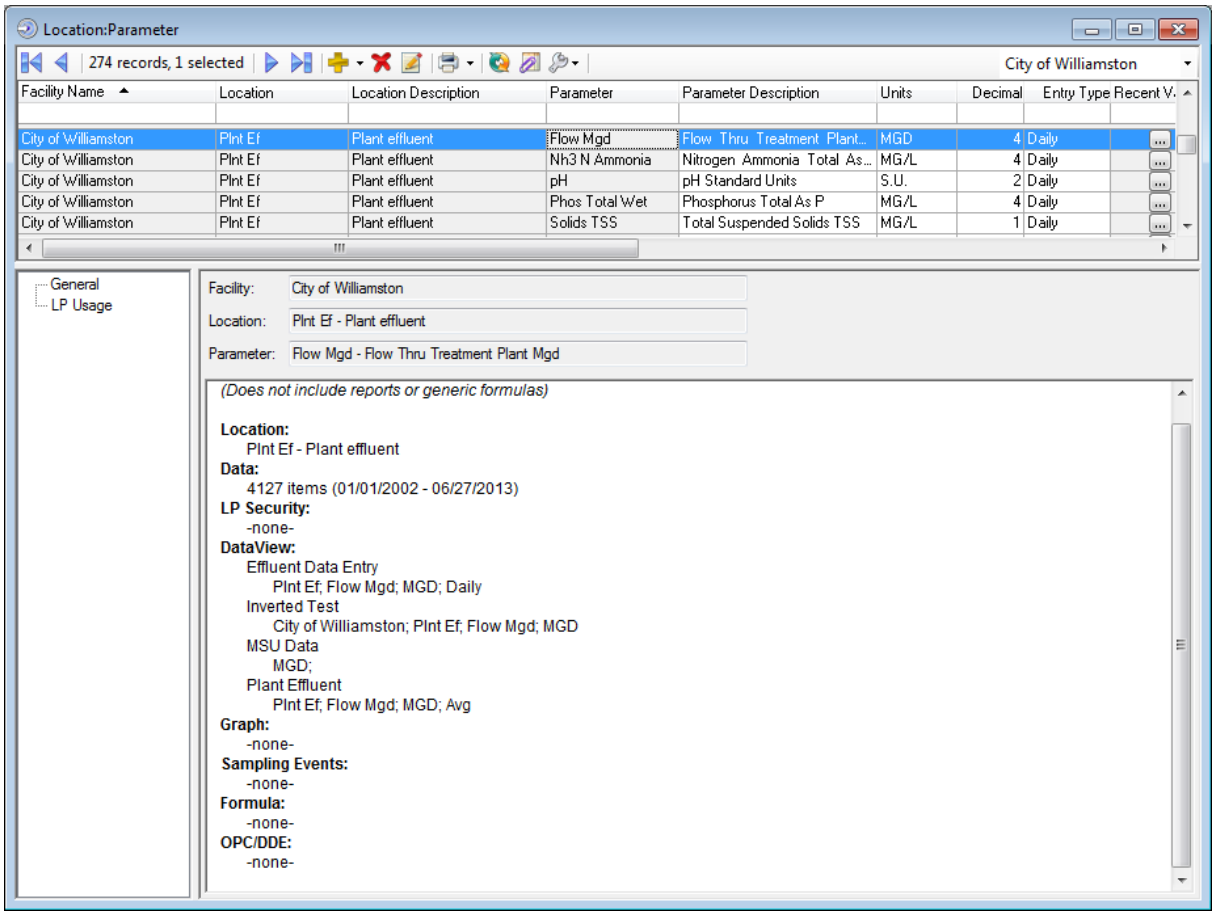
Location:Parameter
274 records, 1 selected
City of Williamston
Facility Name
Location
Location Description
Parameter
Parameter Description
Units
Decimal
Entry Type
Recent V.
City of Williamston Plnt Ef Plant effluent Flow Mgd Flow Thru Treatment Plant... MGD 4 Daily
City of Williamston Plnt Ef Plant effluent Nh3 N Ammonia Nitrogen Ammonia Total As... MG/L 4 Daily
City of Williamston Plnt Ef Plant effluent pH pH Standard Units S.U. 2 Daily
City of Williamston Plnt Ef Plant effluent Phos Total Wet Phosphorus Total As P MG/L 4 Daily
City of Williamston Plnt Ef Plant effluent Solids TSS Total Suspended Solids TSS MG/L 1 Daily
General
LP Usage
Facility: City of Williamston
Location: Plnt Ef - Plant effluent
Parameter: Flow Mgd - Flow Thru Treatment Plant Mgd
(Does not include reports or generic formulas)
Location:
Plnt Ef - Plant effluent
Data:
4127 items (01/01/2002 - 06/27/2013)
LP Security:
-none-
DataView:
Effluent Data Entry
Plnt Ef; Flow Mgd; MGD; Daily
Inverted Test
City of Williamston; Plnt Ef; Flow Mgd; MGD
MSU Data
MGD;
Plant Effluent
Plnt Ef; Flow Mgd; MGD; Avg
Graph:
-none-
Sampling Events:
-none-
Formula:
-none-
OPC/DDE:
-none-

Location:Parameter Usage is visible for a selected L:P. Information includes usage on DataViews, Date Range, Graphs, Formulas and more.

Location:Parameter Usage Data

L:P Usage information provided includes:

- Location Name (displays the full name of the Location)
- Data (displays the number of records as well as the date range for which data exists)
- LP Security (displays any security applied to the individual Location:Parameter)
- DataView (displays any DataViews for which the L:P appears as a column)
- Graph (displays Graphs upon which the L:P is selected as plotted data)
- Sampling Events (displays any Sampling Event data)
- Formula (displays any formulas in which the L:P is identified)
- OPC/DDE (displays LP usage via the OPC/DDE Interface)

Location:Parameter Usage

L:P Usage information is presented for help in identifying all sections of Operator10 - Wastewater where the selected Location:Parameter is in use. This information does not include Reports or Generic Formula. Information provided appears as formatted text

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and can be copied and pasted as needed.

4.7 Data

Data

Analytical Results, Calculated Results, and any other entered information is referred to as **Data**. Data is conveniently entered or viewed using a **DataView**. This Data is used for calculations, reports, process control, or other needs of the Facility.

Data is stored at a specific Location:Parameter, at a specific date or time. It may consist of Daily or Hourly values, Less Than, Greater Than, or Non-Detect values, Time or Date values, or Alpha Codes.

Data values are stored internally with 15 significant digit **Precision**. Internal values are unaffected by the number of display digits or following zeros. Numbers may range to ±1.0E16.

> ***NOTE:*** Entered Data is automatically recognized by its format:
> - Any entry containing a colon (:) is a Time value.
> - Any entry containing a slash (/) is a Date value.
> - Any entry beginning with a number, plus (+), or minus (-) is a Numeric value.
> - Any entry beginning with a Less Than (<) is a Less Than value.
> - Any entry beginning with a Greater Than (>) is a Greater Than value.
> - Any entry beginning with a Tilde (~) is a Non-Detect value.
> - Any entry beginning with an Alphabetic character (A, B, ...) is an Alpha Code.

For storage of the data results, the following table provides a translation of the field 'Type' in the Data.btr table and its equivalent in terms of the data displayed in a section like DataView:

Data Type Value	Data Type
0	Numeric Data
1	Blank
2	Less Than Data (<)
3	Alpha Code
4	Greater Than Data (>)
5	Non-Detect Data (~)
6	Time (:)
8	Date (/)

4.7.1 Add Data

Add Data

In the Add Data dialog, users can enter result data for the selected Facility:Location:Parameter and date. Enter a value and click the **[Apply]** button. Data will immediately be saved to the database and available for use.

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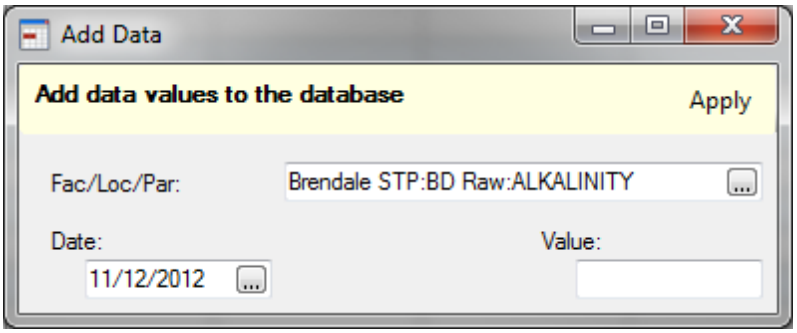

4.7.2 Review Data

Review Data

The **Review Data** dialog provides a list of the recent data values for a selected Location and Parameter. All values can be displayed, place a check in the checkbox labeled **[ ] All Data** in the toolstrip at the top of the window.

From this window, users can add, delete or edit records for any date (and optionally time, if the selected Location:Parameter is hourly).

Click the **[Add]** button to create a new entry and fill in the available fields.

Click the **[Delete]** button to remove an entry.

For Location:Parameters that are flagged as Protected, click the **[Unprotect]** button located in the toolstrip and data entry will be allowed for the length of time that the Review Data window remains open. Upon closing the Review Data window, the Location:Parameter will again be protected.

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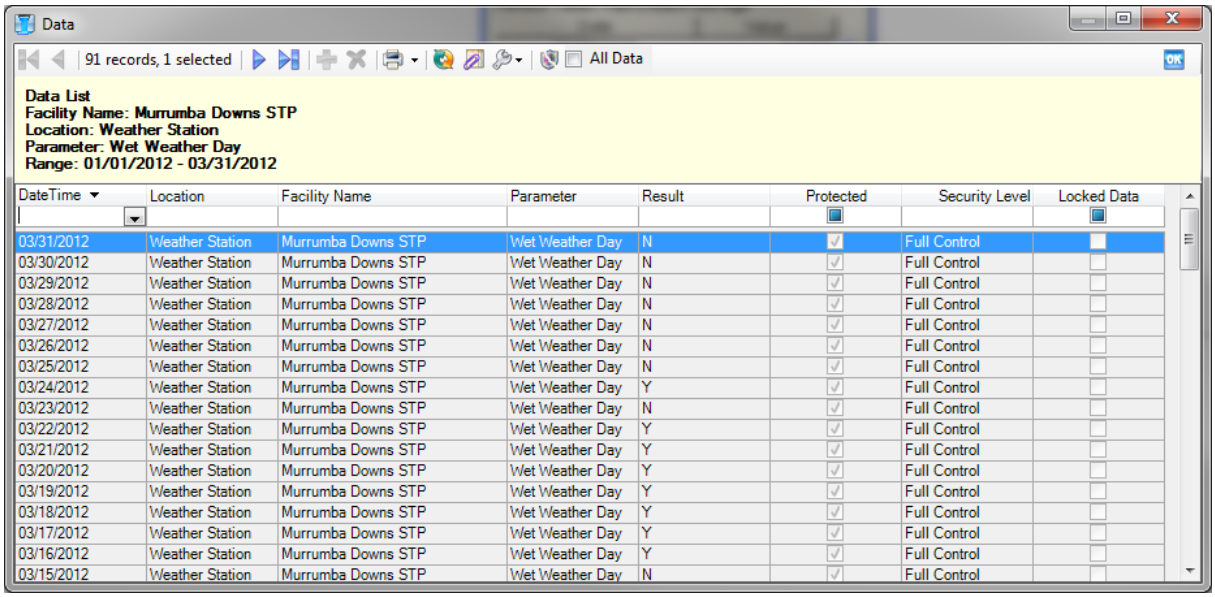

DateTime	Location	Facility Name	Parameter	Result	Protected	Security Level	Locked Data
03/31/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	N	☑	Full Control	☐
03/30/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	N	☑	Full Control	☐
03/29/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	N	☑	Full Control	☐
03/28/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	N	☑	Full Control	☐
03/27/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	N	☑	Full Control	☐
03/26/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	N	☑	Full Control	☐
03/25/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	N	☑	Full Control	☐
03/24/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	Y	☑	Full Control	☐
03/23/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	N	☑	Full Control	☐
03/22/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	Y	☑	Full Control	☐
03/21/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	Y	☑	Full Control	☐
03/20/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	Y	☑	Full Control	☐
03/19/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	Y	☑	Full Control	☐
03/18/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	Y	☑	Full Control	☐
03/17/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	Y	☑	Full Control	☐
03/16/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	Y	☑	Full Control	☐
03/15/2012	Weather Station	Murrumba Downs STP	Wet Weather Day	N	☑	Full Control	☐

The Review Data window displays recent data values stored in the database. All data can be displayed for the selected Location:Parameter.

4.7.3 Data Types

Topics in this section include:

- Alpha Code
- Data Value
- Date
- Greater Than
- Less Than
- Non-Detect
- Time

4.7.3.1 Alpha Code

Alpha Code

Alpha Code data values are one to ten character abbreviations that are stored at a specific Location:Parameter, at a specific date and time. The first character must be non-numeric, and case is ignored. A description is associated with each Alpha Code. Any entry beginning with an Alphabetic character (A, B, ...) is an Alpha Code value.

If set in the Facility Options, the Alpha Code "AA" may be treated in calculations as a zero value. Likewise "T" (True) and "Y" (Yes) may be treated as 1, "F" (False) and "N" (No) may be treated as 0.

4.7.3.2 Data Value

Data Value (Numeric)

Daily or Hourly Data values are **numeric** values stored at a specific Location:Parameter,

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at a specific date (and time for Hourly Data). Numbers may range to±1.0E16. Any entry beginning with a number, plus (+), or minus (-) is a Daily or Hourly value.

4.7.3.3 Date

Date Data Values

Date data values are stored at a specific Location:Parameter, at a specific date and time. Date values may range from 01/01/1900 to 12/31/9999. Any entry containing a Slash (/) is a Date value. (Enter a leading slash (/) for date formats which do not contain the slash (/) character: for example "/+7")

Displayed dates for United States users are usually represented in the form "MM/DD/YY" where MM is a month from 01 to 12, DD is a day of the month from 01 to 31, and YY is the last two digits of the year from 0 to 99. Valid dates range from January 1, 1899 through December 31, 9999. Dates for **International** users are dependent on Windows settings.

Date values used in calculations and DataView summaries will be treated as the number of days represented (actually, the number of days since 01/01/4713 BC). The result itself is usually a Date value. Useful summary information is therefore limited to average, maximum, or minimum.

4.7.3.4 Greater Than

Greater Than Data Values

Greater Than data values are stored at a specific Location:Parameter, at a specific date and time. Greater Than values may range to±1.0E16. Any entry beginning with a Greater Than (>) is a Greater Than value.

A **Greater Than** value used in calculations, DataView summaries, and reports will be treated in one of four ways: Blank (no data), Zero, Twice the Entered Value, Entered Value, or Preserve Greater Than.

4.7.3.5 Less Than

Less Than Data Values

Less Than data values are stored at a specific Location:Parameter, at a specific date and time. Less Than values may range to±1.0E16. Any entry beginning with a Less Than (<) is a Less Than value.

A **Less Than** value used in calculations, DataView summaries, and reports will be treated in one of four ways: Blank (no data), Zero, Half the Entered Value, Entered Value, or Preserve Less Than.

4.7.3.6 Non-Detect

Non-Detect Data Values

Non-Detect data values are stored at a specific Location:Parameter, at a specific date

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and time. Non-Detect values may range to±1.0E16. Any entry beginning with a Tilde (~) is a Non-Detect value.

A **Non-Detect** value used in calculations, DataView summaries, and reports will be treated in one of four ways: Blank (no data), Zero, Half the Entered Value, Entered Value, or Preserve Non-Detect.

4.7.3.7 Time

Time Data Values

Time data values are stored at a specific Location:Parameter, at a specific date and time. Time values may range from 00:00 to 45:12:15. Any entry containing a Colon (:) is a Time value.

The **format** of Time values is **d:hh:mm** where d is optional days, hh is a two-digit hour, and mm is a two-digit minute. Time values through 24 hours are displayed as hh:mm and compatible with a 24:00 clock, and may be used to store **time-of-day** values. Any Time values may represent **duration** values.

Time values used in calculations and DataView summaries will be treated as the number of minutes represented. Time values may therefore be used in conjunction with numeric data values (treated as minutes). The result itself is usually a Time value.

4.8 Process Control

Process Control

The Process Control section of Operator10 - Wastewater allows users to define and identify the specific water treatment processes that occur in the Facility. A Process consists of Process Sections, containing Location:Parameters, summary information, dimension information other values necessary for the calculation of data using standard water and wastewater treatment math.

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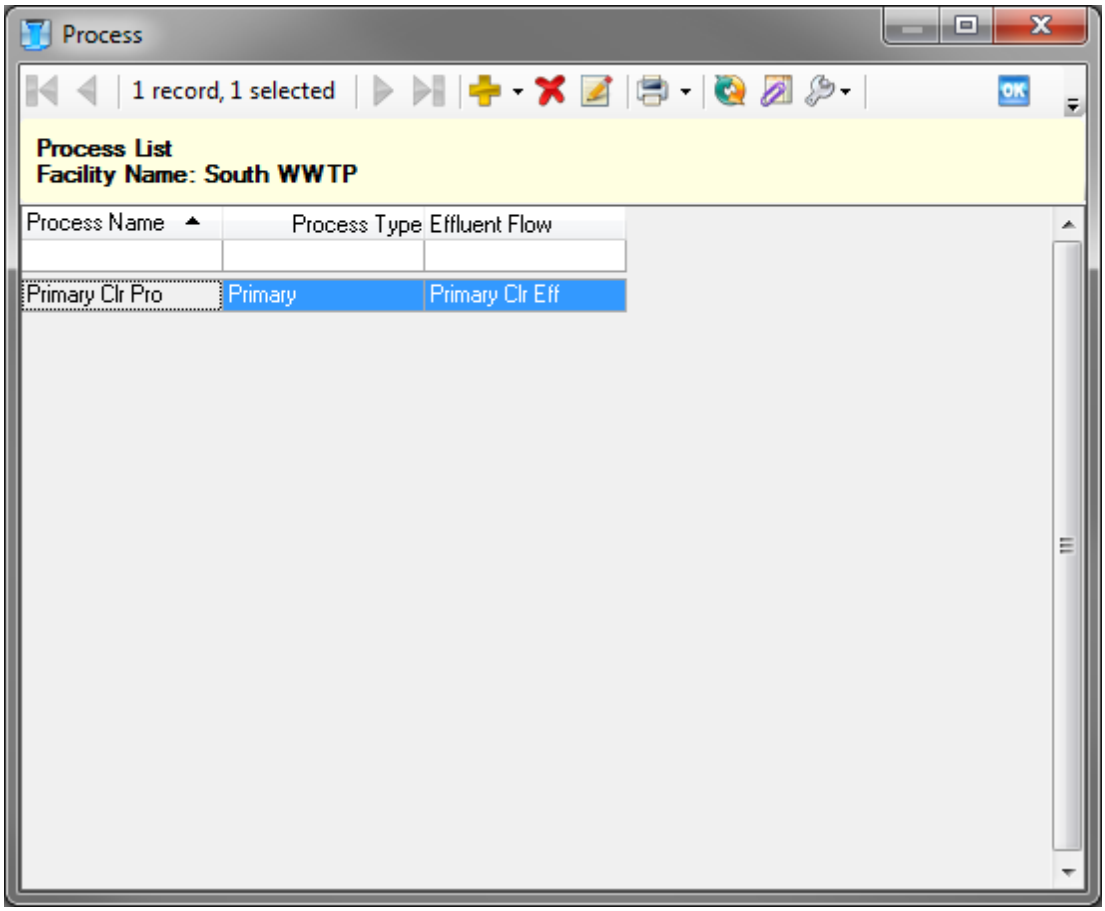

Accessing Processes

To access the Process section, go to the **Setup** ribbon/menu and choose **[Processes]**. The Process list will open.

Add a New Process

To add a new process, click the **[New]** button to begin. The Process Setup screen will open, see the Process Setup topic for more information.

Edit a Process

To edit an existing process highlight an existing process in the list and click the **[Edit]** button. Editing of the Process Setup will occur in the Process Setup.

Delete a Process

To delete an existing process, highlight an existing process in the list and click the **[Delete]** button. Click the Yes **[Yes]** button to confirm or No **[No]** to cancel the deletion of data.

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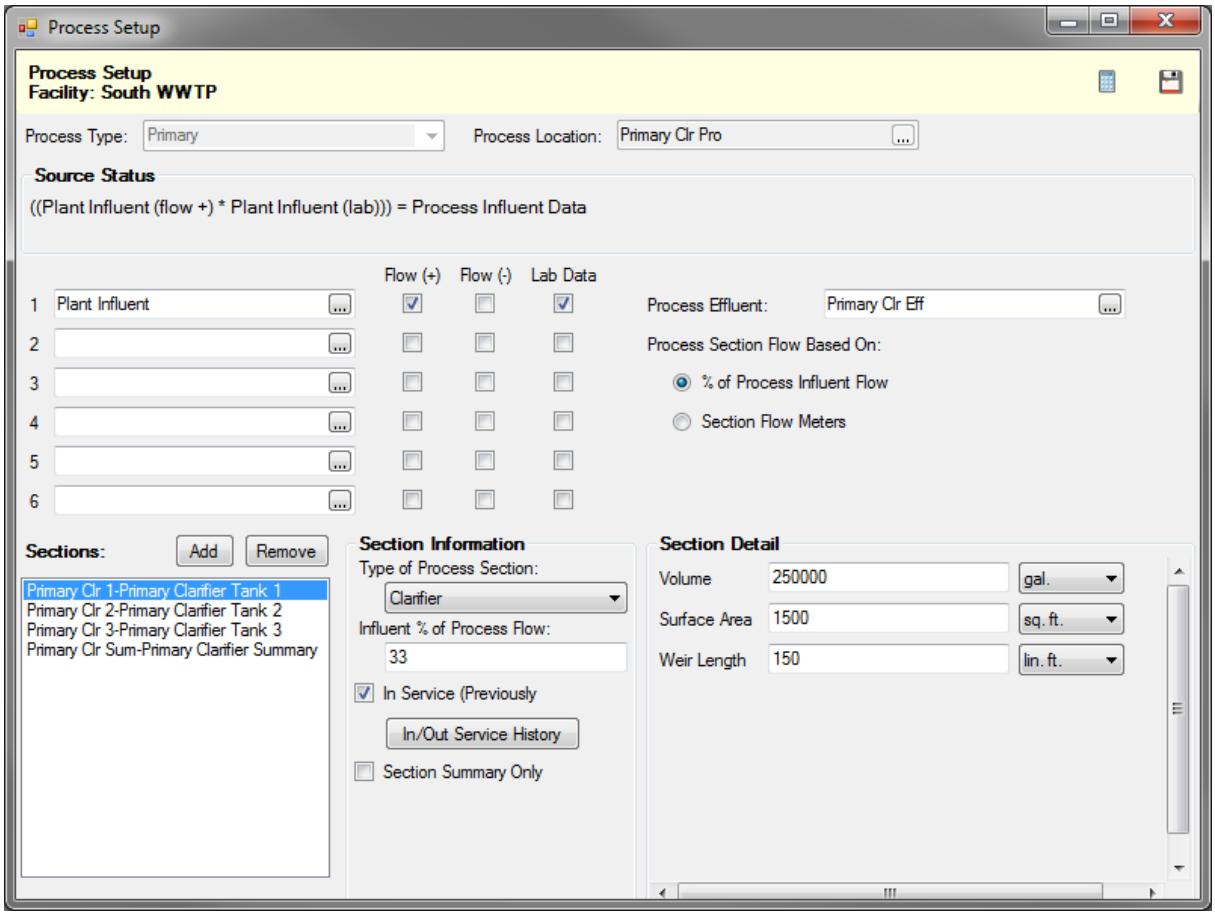
4.8.1 Process Setup

Process Setup

The Process Setup screen allows users to define and maintain process control settings to assist in the calculation of standard water and wastewater math.



The Process Setup section allows users to define process influent, process effluent, process section, dimension, flow rate and other information in order to calculate process control values using standard water and wastewater math.

The following options can be defined in the Process Setup section:

- **Process Type:** Select from the drop-down list to identify the type of process to be created
- **Source Status:** In the six available spaces, define the influent source(s) of data; click the [...] button to select locations from the Location list
  - **Flow (+):** Place a check in the checkbox for Flow (+) if the location selected is a source of positive, influent flow for the process
  - **Flow (-):** Place a check in the checkbox for Flow (-) if the location selected is a source of flow data which is to be subtracted from the process

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- **Lab Data:** Place a check in the checkbox for Lab Data if the location selected is a source of concentration (mg/L, ug/L, etc) values (examples may include BOD, TSS, Ammonia, etc.)

NOTE: This information is used to calculate a single influent flow and appropriate lab data for the Process. Each flow location is listed on a line and checked. If no lab is checked on that line, the flow will "accumulate" to the next line. When a lab is checked, it is assumed that lab data is available at that point, and flow is based on any accumulated flow at that point. Each flow must have, or accumulate to, a lab. Each lab must have, or be preceded by, a flow.

- **Process Effluent:** Press the **[...]** button to select the location which represents the effluent source of data for the process
- **Process Section Flow Based On:**
  - **% of Process Influent Flow:** When selected, users will be required to enter a numeric percentage which will be used to calculate the approximate amount of flow entering the process section
  - **Section Flow Meters:** When selected, the calculations will assume that there is a flow value present which will be used to calculate
- **Sections:**
  - Press the **[Add]** button to add a location to be used as a process section
  - Press the **[Remove]** button to remove a location from the section list
- **Section Information:** With a process section defined, the following information must be entered for calculation purposes
  - **Type of Process Section:** Select from the drop-down menu the type of process section that best describes the section to be added
  - **Influent % of Process Flow:** Enter a numeric value to define the percent of process influent flow that enters the treatment section
  - **In Service:**
    - **[In/Out Service History]:** Press the [In/Out Service History button to display a historical list of in service/out of service events for the selected process section
  - **Section Summary Only:** Place a check in the checkbox to indicate that the process section is a summary section, additional information may be required, see section detail for more information
- **Section Detail:** Depending on the type of section selected as well as whether the section is a summary, additional information may be required, please enter any available information.

NOTE: The process control section may require additional information, please contact Operator10 - Wastewater technical support for a guided tour or explanation of the section.

Create Calculations

To create calculations based on the entered process information, click the

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[Create process calculations] button to begin. For more information, see the Create Process Calculations topic.

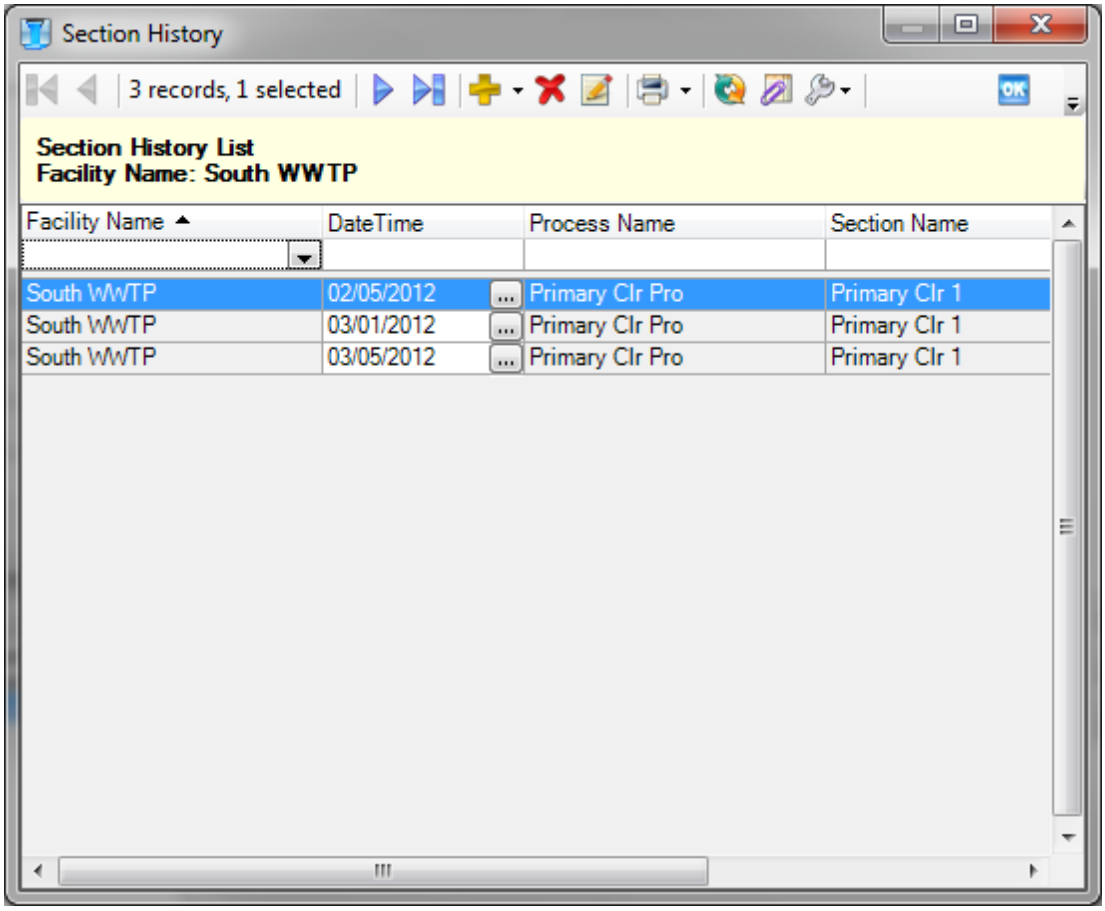
Save Process Setup

Press the **[Save]** button to save the data entered into the Process Setup section.

4.8.2 Process Section History

Process Section History

The Process Section History displays and allows for the entry of any events in which a process section (clarifier, tank, basin, filter, etc.) is taken in or out of service. In creating this record or history of the process section, Operator10 - Wastewater can properly calculate those process calculations based on whether the section in use or not.


Section History
3 records, 1 selected
OK
Section History List
Facility Name: South WWTP
Facility Name
DateTime
Process Name
Section Name
South WWTP 02/05/2012 Primary Clr Pro Primary Clr 1
South WWTP 03/01/2012 Primary Clr Pro Primary Clr 1
South WWTP 03/05/2012 Primary Clr Pro Primary Clr 1

Add Process History

To add Process History notes for a process section, press the **[Add]** button to begin.

Enter the following information to log an in/out of service event:

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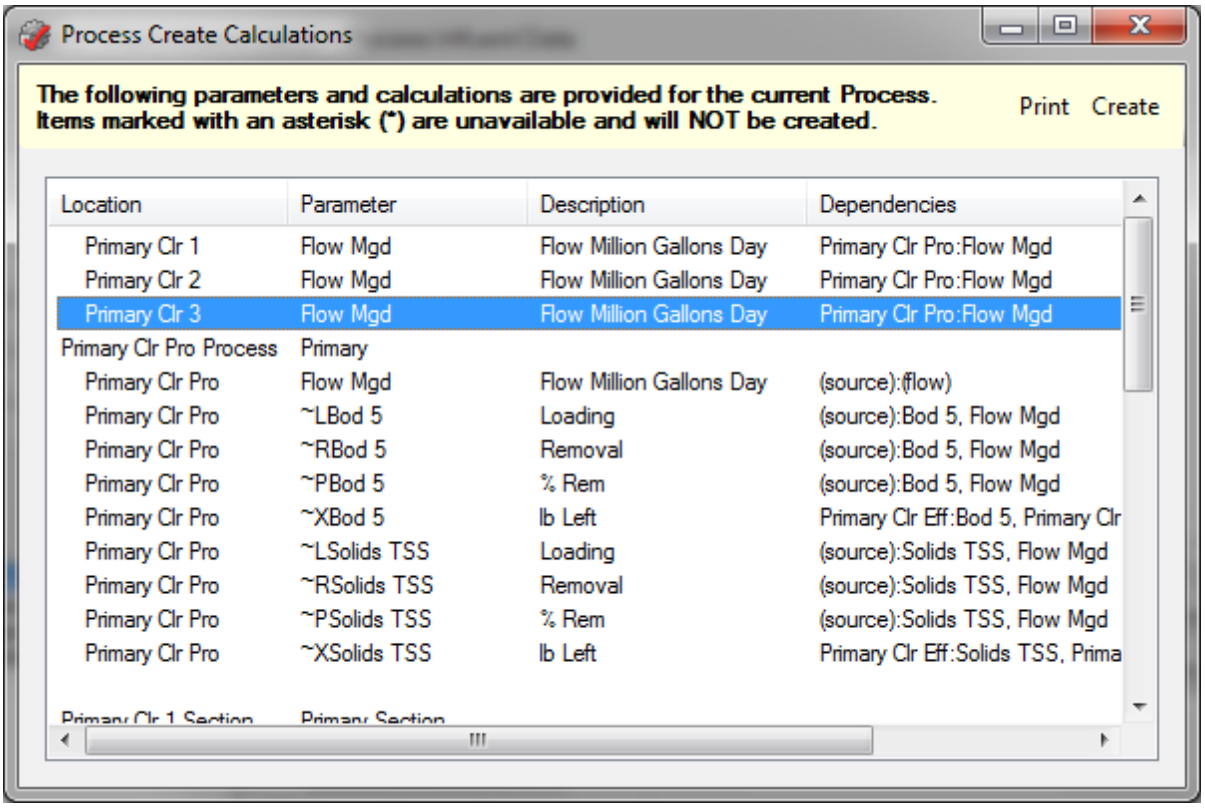
- **Date:** Enter or select a date from the calendar to specify the date on which the section was in or out of service
- **Process Name:** Click the **[...]** button to select a process from the Process list
- **Process Section:** Click the **[...]** button to select a process section from the selected Process
- **Active:** Place a check in the checkbox for Active if the section was in service on the date specified, leave unchecked for out of service events

4.8.3 Create Process Calculations

Process Create Calculations

Upon completing the setup of the process, calculations can be created to generate the desired process data. Depending on the type of process as well as the information provided during process setup, calculations will be provided. Each calculation provided will create a unique Location:Parameter that will help to calculate and store the process data. The Process Create Calculations window displays that list.



Create Calculations

Upon review of the list of calculations to be generated, users should press the **[Create]** button to generate the provided Location:Parameters. This process will create the L:Ps as well as the necessary internal formulas used in the calculation of this data.

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Print Calculations list

Click the **[Print]** button to print the provided list of calculations for review.

4.9 Formula

Formula

Formulas may be entered and used by name for calculating Location:Parameter values. Additionally, formulas can be written for use in DataViews, Reports and Graphs. For more information contact AllMax Technical Support.

The Formula List displays all formulas associated with the selected facility. Formula Details displays details of the currently selected formula.

Accessing the Formula List

To access the Formula list, go to the **Setup** ribbon and choose the **[Formula]** button. This will display the Formula list.

Internal Formulas
To view Internal Formulas only, place a check in the **[ ] Internal Formulas** checkbox. To view formulas from another facility, use the drop down menu in the toolbar to choose a different facility.

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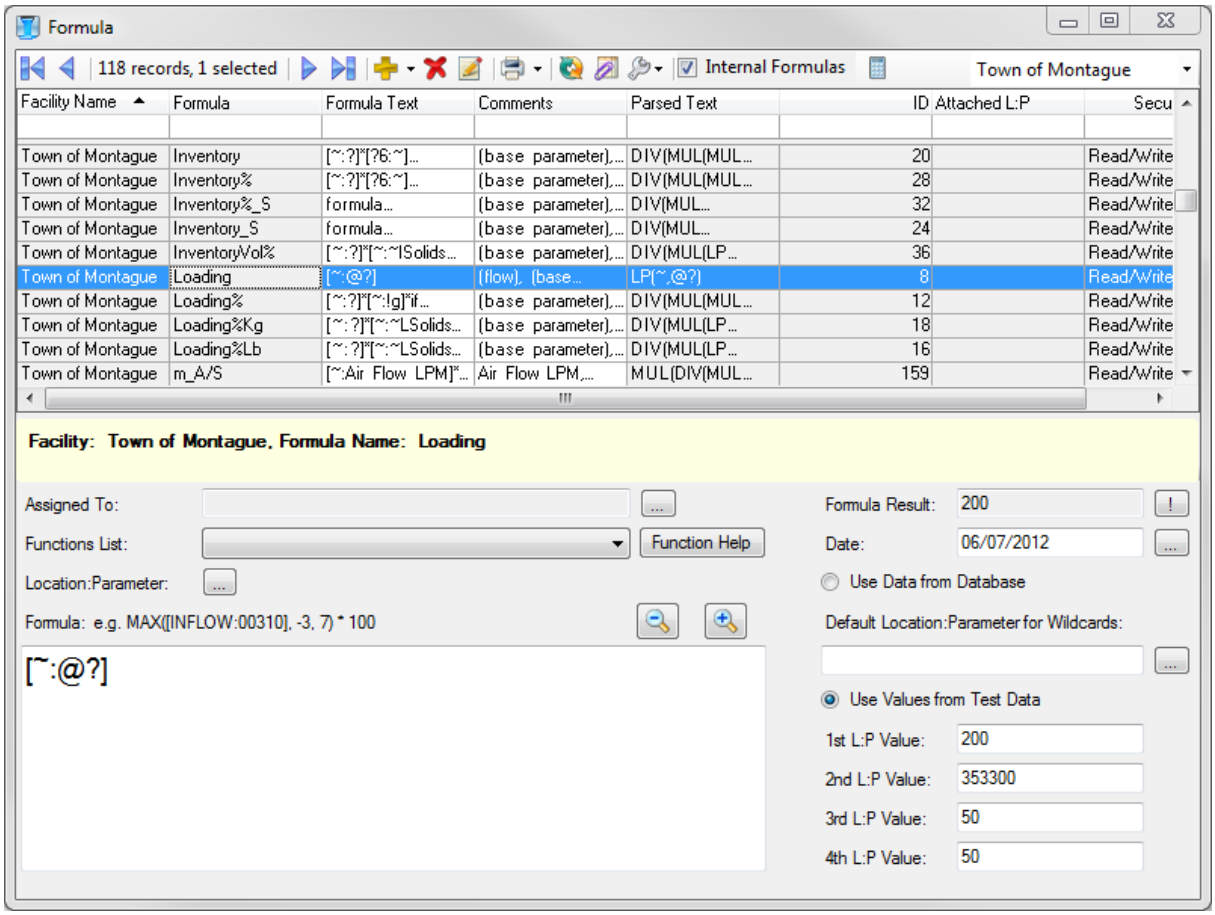
Formula
118 records, 1 selected
Internal Formulas
Town of Montague
Facility Name
Formula
Formula Text
Comments
Parsed Text
ID
Attached L:P
Secu
Town of Montague Inventory [~:?]*[?6:~]... (base parameter),... DIV(MUL(MUL... 20 Read/Write
Town of Montague Inventory% [~:?]*[?6:~]... (base parameter),... DIV(MUL(MUL... 28 Read/Write
Town of Montague Inventory%_S formula... (base parameter),... DIV(MUL... 32 Read/Write
Town of Montague Inventory_S formula... (base parameter),... DIV(MUL... 24 Read/Write
Town of Montague InventoryVol% [~:?]*[~:~ISolids... (base parameter),... DIV(MUL(LP... 36 Read/Write
Town of Montague Loading [~:@?] (flow), (base... LP(~,@?) 8 Read/Write
Town of Montague Loading% [~:?]*[~:!g]*if... (base parameter),... DIV(MUL(MUL... 12 Read/Write
Town of Montague Loading%Kg [~:?]*[~:~LSolids... (base parameter),... DIV(MUL(LP... 18 Read/Write
Town of Montague Loading%Lb [~:?]*[~:~LSolids... (base parameter),... DIV(MUL(LP... 16 Read/Write
Town of Montague m_A/S [~:Air Flow LPM]*... Air Flow LPM,... MUL(DIV(MUL... 159 Read/Write
Facility: Town of Montague, Formula Name: Loading
Assigned To:
Functions List:
Function Help
Location:Parameter:
Formula: e.g. MAX([INFLOW:00310], -3, 7) * 100
[~:@?]
Formula Result: 200
Date: 06/07/2012
Use Data from Database
Default Location:Parameter for Wildcards:
Use Values from Test Data
1st L:P Value: 200
2nd L:P Value: 353300
3rd L:P Value: 50
4th L:P Value: 50

Formula List Functionality

The Formula list and Formula editor window have the general properties of the Grid and Grid Edit windows. (For more information about these sections, please see the topic: Grid Functionality).

In the Formula List, users can:

- Add Formula
- Delete Formula
- Edit Formula
- Calculate

4.9.1 Add Formula

Add Formula

To add a new formula, click the **[Add]** button from the Formula list window.

1. Enter a unique **Formula Name** (1 to 30 characters) for each formula.
2. **Remarks** can be entered to help describe or define the formula.

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3. Formulas can be **Assigned To** Location:Parameters by clicking the **[...]** button and selecting the desired L:Ps.
4. **Functions** may be chosen from the drop-down list. The Function Help file can be accessed for additional support while writing formulas.
5. **Location:Parameters** may be selected from a PickList using the **[...]** popup button.
6. To increase or decrease the displayed font size for the Formula field, click the buttons.
7. The **Formula** itself (1 to 1000 characters) is written in mathematical style, using Location:Parameter names, constants, functions, parentheses, etc. The value calculated as a result will be written to the Location:Parameter which uses the Formula. More than one Location:Parameter may use the same Formula.
8. In the **Formula Test** area, testing of written formulas can be performed in 2 ways. (For date-based or formulas sensitive to dates, enter a test Date to be used when testing the written formula.)
   - **() Use values from Test Data**: Use this option to test with user-entered data in the fields 1st L:P Value:, 2nd L:P Value, 3rd L:P Value, and 4th+ L:P Value.
   - **() Use Data from Database**: Use this option to test with a selected L:P from the facility.

Note: The Formula is limited by both the number of characters in the Formula (1000 characters), the Parsed size (1500 characters). Contact AllMax for additional information.

Examples:

[Plant Influent:Flow MGD] * 1000000
the flow of "Plant Influent" in MGD converted to gallons per day

[Plant Influent:Flow MGD] + [Recycled:Flow MGD] / 2
add flow of "Plant Influent" to flow of "Recycled" and divide by 2

IF(ISBLANK([Plant Influent:Flow MGD]),0,[Plant Influent:Flow MGD])
if there is no flow at "Plant Influent" then return 0, otherwise return the flow

MAX([Aer 1:BOD 5],[Aer 2:BOD 5])
the greater of the BOD value at "Aer 1" or "Aer 2"

[Meter:Number] - D_VAL([Meter:Number],0,-1)
the value of parameter "Number" at location "Meter" less yesterday's value

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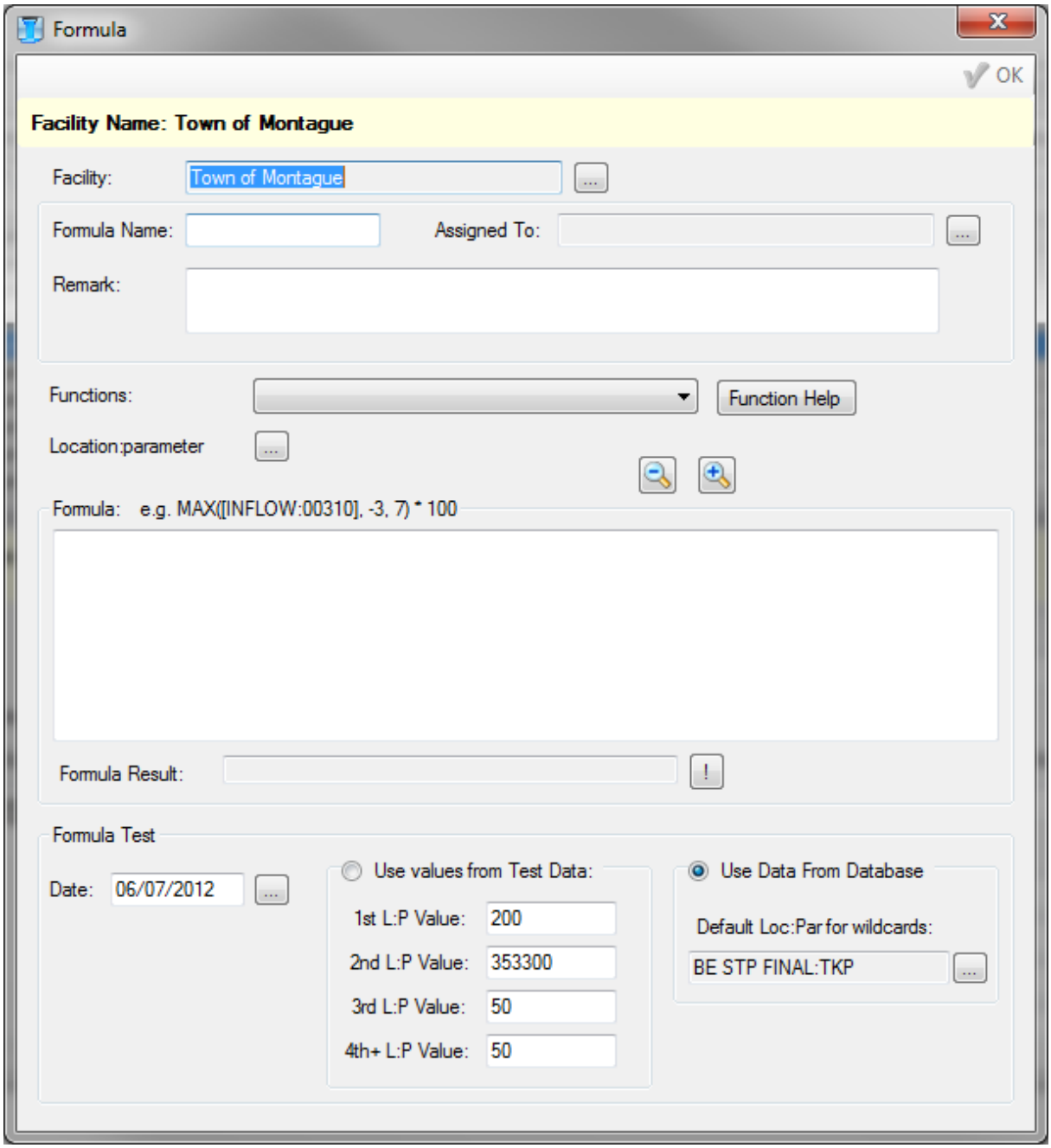

4.9.2 Delete Formula

Delete Formula

Formulas can be deleted from the database, click the **[Delete]** button to delete records. Individually selected records can be deleted as well as multiple selections of formulas. Confirmation is required when deleting formulas from the database. Click the Yes **[Yes]** button to confirm or No **[No]** to cancel the deletion of data.

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WARNING: All information associated with the selected record(s) will be deleted upon confirmation of the deletion. This is permanent and cannot be undone.

4.9.3 Formula List

The Formula List window is split into two sections, a Formula list and a Formula editor.

Formula List

For more information about the functionality of the Formula list, see the Formula help topic.

Formula Editor

Users can select formula from the Formula list and edit/view the details of the formula in the lower half of the Formula window. For more information, see the following.

- **Assigned To:** The Assigned To field displays the Location:Parameter(s) to which the formula is attached. Click the **[...]** button to add to the list of selected Location:Parameters.
- **Functions List:** To edit the formula and use a desired Function, select from available Functions in the drop-down menu. The selected Function will be inserted into the formula in the Formula field.
- **Location:Parameter:** To select a Location:Parameter to be used in the written formula, click the **[...]** button to display a list of available Location:Parameters. The selected Location:Parameter will be inserted into the Formula field.
- **Formula:** Edit the formula in the Formula field.

NOTE: Changes to the formula are saved immediately.

Additional Functionality

- To increase or decrease the displayed font size for the Formula field, click the buttons.
- The **Formula Result:** field will display the calculated result of the formula based on testing information provided:
  - In the Formula Test area, testing of written formulas can be performed in 2 ways. (For date-based or formulas sensitive to dates, enter a test Date to be used when testing the written formula.)
    - **() Use values from Test Data:** Use this option to test with user-entered data in the fields 1st L:P Value:, 2nd L:P Value, 3rd L:P Value, and 4th+ L:P Value.
    - **() Use Data from Database:** Use this option to test with a selected L:P from the facility.

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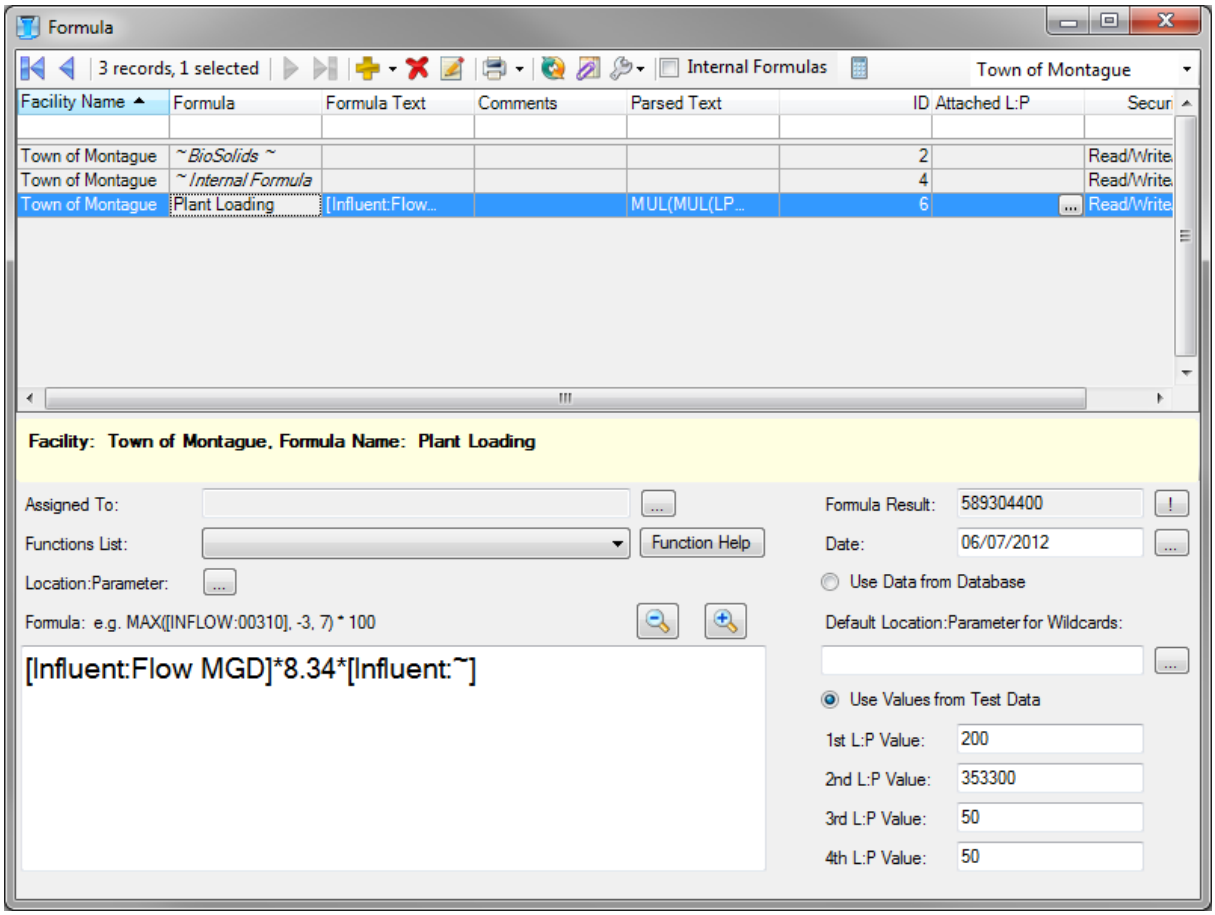

4.9.4 Internal Formulas

Internal Formulas

Several **Internal Formulas** are supplied with the application. These formulas are automatically attached to appropriate parameters when [Create Calculations] is pressed in the Process Editor. These formulas should not be modified, although they may be attached to other user-defined Location:Parameters.

(see also: Process, Formula, Calculate, Internal Parameters)

For your information, the Internal Formulas are described below:

(**Formula Name**: example parameter = example method of calculation)

- **accum_process**: Accumulated flow to a Process "Flow MGD" and calculated loadings for MGL and % solids parameters (to LB) = flow1 "Flow MGD" ± flow2 "Flow MGD" ± ...
- **accum_section**: Accumulated flow to a Process Section "Flow MGD"
- **Vol%**: percent volatile solids "Solids Vol %" = volatile solids "Solids TVSS" / total solids "Solids TSS" * 100
- **Loading**: parameter in MGL or UGL to loading in LB "~LBOD 5" = BOD "BOD 5" * flow "Flow MGD" * 8.34

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- **Loading%**: total solids in LB "~LSolids Vol %" = total solids "Solids Vol %" * flow "Flow MGD" * specific gravity (defaults to 1) "Spec Gravity" * 8.34 * 10000
- **Loading%Lb**: percent volatile solids to LB: percent volatile solids "Solids Vol %" * percent total solids "Solids Vol %" / 100
- **Inventory**: Inventory in LB "~ISolids TSS" = total solids "Solids TSS" * volume of tank * 8.34 / 1000000
- **Inventory%**: Inventory in LB "~ISolids Vol %" = percent total solids "Solids Vol %" * volume of tank * 8.34 / 10000
- **Inventory%Vol**: Inventory in LB "~ISolids Vol %" = percent volatile solids "Solids Vol %" * Inventory in LB "~ISolids Vol %"
- **F/M_CBOD**: Food / Microorganism ratio "~F/M" = section influent CBOD in LB "~LBOD Carb 5" / total solids in LB "~LSolids TVSS" or volatile solids in LB "~LSolids TSS"
- **F/M**: Food / Microorganism ratio "~F/M" = section influent BOD in LB "~LBOD 5" / total solids in LB "~LSolids TVSS" or volatile solids in LB "~LSolids TSS"
- **F/MV**: Food / Microorganism ratio "~F/M" = section influent volatile solids in LB "~LSolids Vol %" or volatile solids in LB "~LSolids TVSS"/ inventory volatile solids in LB "~ISolids Vol %" or inventory volatile solids in LB "~ISolids TVSS"
- **SVI**: Sludge Volume Index "~SVI" = settleable solids "Solids Settlbl" / volatile solids "Solids TSS" * 1000
- **MCRT**: Mean Cell Resonance Time "~MCRT" = inventory volatile solids in LB "~ISolids TSS" / sum of waste volatile solids loadings in LB "~LSolids Vol %" or "Solids TSS"
- **MCRTS**: solids Mean Cell Residence Time "~MCRT" = inventory volatile solids in LB "~ISolids Vol %" or "~ISolids TVSS" / sum of waste volatile solids in LB "~LSolids Vol %" or "~LSolids TSS"
- **SOR**: Surface Overflow Rate in GPD/SF "~SOR" = flow in GAL / surface area of tank
- **SOR_M**: Surface Overflow Rate in GPM/SF "~SOR_M" = flow "Flow MGD" / surface area of tank / 1440 * 1000000
- **WOR**: Weir Overflow Rate "~WOR" = flow in GAL / weir length
- **WOR_M**: Weir Overflow Rate "~WOR" = flow in GAL per MIN / weir length
- **DT_SEC**: Detention Time in Seconds "~DT_SEC" = volume of tank / flow in GAL * 86400
- **DT_MIN**: Detention Time in Minutes "~DT_MIN" = volume of tank / flow in GAL * 1440
- **DT_HR**: Detention Time in Hours "~DT_HR" = volume of tank * runhours "RUNHRS" (defaults to 24) / flow "Flow MGD" / 1000000
- **DT_DAY**: Detention Time in Days "~DT_DAY" = volume of tank / flow in GAL
- **F_VOL**: Filtration Volume in Gal "~F_VOL" = flow in GAL * runhours "RUNHRS" / 24
- **F_RATE**: Filtration Rate in G/MIN/SQFT "~F_RATE" = Filtration Vol "~F_VOL" / runhours "RUNHRS" / volume of tank / 60
- **UFRV**: Unit Filter Run Volume in G/SQFT "~UFRV" = Filtration Vol "~F_VOL" / volume of tank
- **B_RATE**: Backwash Rate in G/MIN/SQFT "~B_RATE" = Backwash flow in GPM / volume of tank
- **B_VOL**: Backwash Vol in Gal "~B_VOL" = Backwash flow in GAL * minutes "BWASHM" / 24

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- **B_VOL_P**: Backwash Percent "~B_VOL_P" = Backwash Vol "~B_VOL" / Filtration Volume "~F_VOL" / 100
- **SL_SF**: Solids Loading in LB/SF "~SL_SF" = loading in LB "~LSolids Vol %" or "~LSolids TSS" / surface area of tank
- **SL_KCF_CBOD**: Solids Loading in LB/1000CF "~SL_KCF" = loading in LB "~LBOD Carb 5" / volume of tank * 7480
- **SL_KCF**: Solids Loading in LB/1000CF "~SL_KCF" = loading in LB "~LBOD 5" / volume of tank * 7480
- **SL_HSF**: Solids Loading in LB/HR/SF "~SL_HSF" = loading in LB "~LSolids Vol %" or "~LSolids TSS" / runhours "RUNHRS" / surface area of tank
- **SL_CF**: Solids Loading in LB/CF "~SL_CF" = loading in LB "~LSolids Vol %" or "~LSolids TSS" / volume of tank * 7.48
- **SL_CFVol**: Volitile Solids Loading in LB/CF "~SL_CF" = loading in LB "~LSolids Vol %" or "~LSolids TVSS" / volume of tank * 7.48
- **RespRate**: Respiration Rate in MG/HR/GVSS "RESP" = oxygen uptake in MG/L/HR "OXYUPT" / solids in MGL "Solids TVSS" or "Solids TSS" * 1000
- **Flow_P**: Flow Percent "~FLOW_P" = waste flow "Flow MGD" / influent flow "Flow MGD" * 100
- **Flow_T**: Total Flow in MGD "~FLOW_T" = waste flow "Flow MGD" + influent flow "Flow MGD"
- **HLoad**: Hydrolic Loading in GPD/SF "~HLOAD" = waste flow "Flow MGD" + influent flow "Flow MGD" / surface area of tank * 1000000
- **Alk/NH3**: Alkalinity/NH3-N Ratio "~ALK/NH3" = alkalinity "Alkalinity" / ammonia "Nh3 N Ammonia"
- **VolAcid/Alk**: Volatile Acid/Alkalinity Ratio "~VA/A" = volatile acids "Volatile Acids" / alkalinity "Alkalinity" or "PhenPhLfinAlk"
- **VolRed%**: Percent Volatile Reduction "~VOLRED%" = (1 - (%VSS out "Solids Vol %" / %VSS in "Solids Vol %")) / (1 - (%VSS out "Solids Vol %" / 100)) * 100
- **A/S**: Air/Solids Ratio "~A/S" = airflow in CFM "AIRFLO" * runhours "RUNHRS" / influent loading in LB "~LSolids Vol %" or "~LSolids TSS" * 4.5
- **WasteFlow**: Waste Flow % "~WASTE_F" = waste flow "Flow MGD" + waste flow "Flow MGD"
- **WasteRem**: Waste SS Removed "~WASTE_R" = (solids in MGL "Solids TSS" * flow "Flow MGD" * 8.34) + (solids in MGL "Solids TSS" * flow "Flow MGD" * 8.34)
- **AirFlow**: Air Flow in MCF "~AIRFLOW" = airflow in CFM "AIRFLO" * 1440 / 1000000
- **AF/B**: Air Flow/BOD in CF/LB "~AF/B" = airflow in CFM "AIRFLO" / loading in LB "~LBOD 5" * 1440
- **AF/B_R**: Air Flow/BOD Removed in CF/LB "~AF/B_R" = airflow in CFM "AIRFLO" / loading removed in LB "~LBOD 5" * 1440
- **Grit/Grease**: Grit or Grease Removed in CF/MG "~GGRTVOL" = volume removed in cubic yards "GRTVOL" / flow "Flow MGD" * 27
- **GritWeight**: Grit Removed in KLB/MG "~GRIT" = volume removed in cubic yards "GRTVOL" / flow "Flow MGD" * specific gravity (defaults to 1) "Solids Vol %" * 1.6848
- **Yield_HR**: Cake Yield in LB/HR "~YLD_HR" = loading in LB "~LSolids Vol %" or "~LSolids TSS" / runhours "RUNHRS"

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- **Yield_HR_U**: Cake Yield in LB/Units/HR "~YLD_HR" = loading in LB "~LSolids Vol %" or "~LSolids TSS" / volume or surface area of tank / runhours "RUNHRS"
- **S_Avg**: Summary Average of Sections "~ABC" = average of sections "~ABC"
- **S_Sum**: Summary Sum of Sections "~ABC" = sum of sections "~ABC"

4.10 Alpha Codes

Alpha Code

An **Alpha Code** is a one to ten character abbreviation that may be defined and entered as Data. The characters may be alphabetic (A-Z) and/or numeric (0-9), and case is ignored. A description (1 to 60 characters) will be associated with each Alpha Code.

> ***NOTE:*** A special case exists for the Alpha Code "AA", which may be printed in place of Less Than values in DataViews and some Reports. Additionally, as a default, "AA" is treated numerically as 0. Likewise "T" (True) and "Y" (Yes) may be treated as 1, "F" (False) and "N" (No) may be treated as 0.

Accessing the Alpha Code section

To access the Alpha Code section, go to the **Setup** ribbon and click the **[Alpha Codes]** button.

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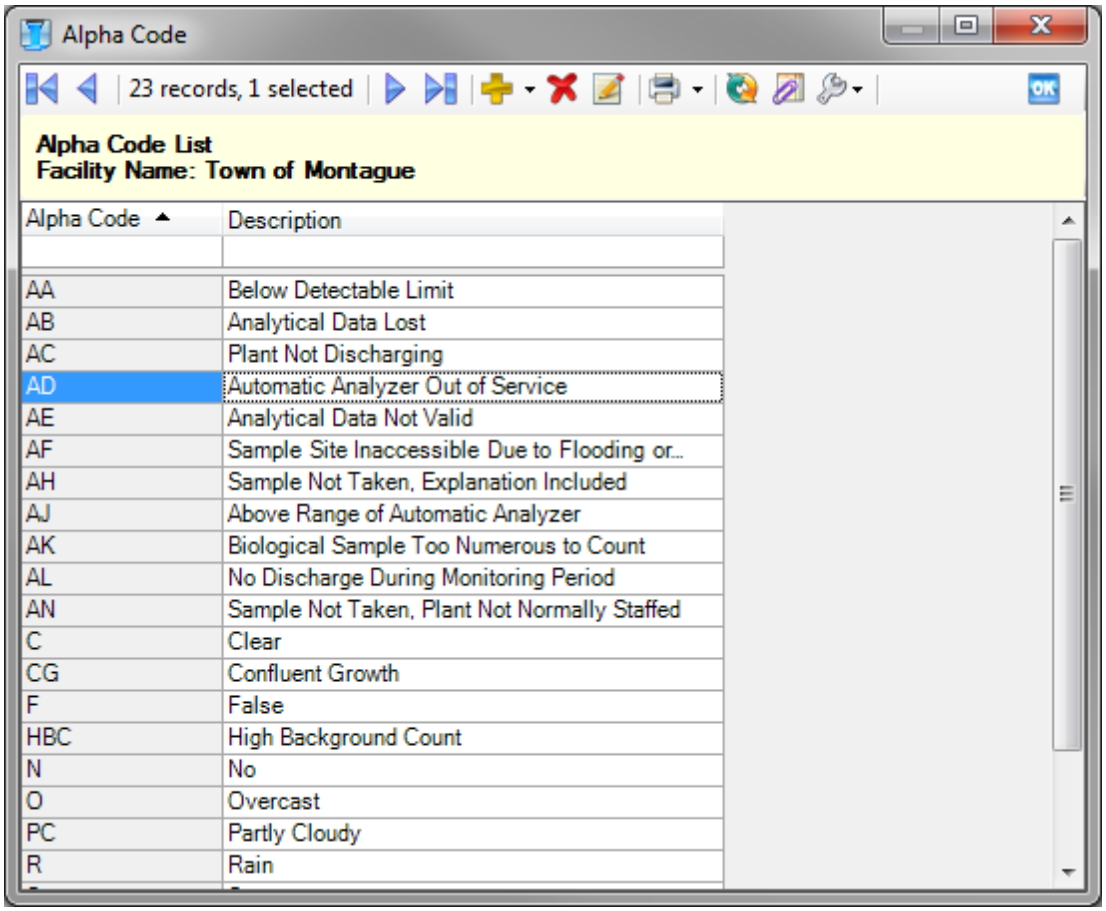

Add Alpha Code

Users can create additional Alpha Codes for usage throughout Operator10 - Wastewater, click the **[Add]** button.

Enter the desired Alpha Code in the **Alpha Code*:** field; a **Description** can be entered as well. Click the **[Save]** button to save the entry.

Delete Alpha Code

Users can delete Alpha Codes as needed; with an Alpha Code selected, click the **[Delete]** button. Confirm the deletion of data by clicking the Yes **[Yes]** or No **[No]** button.

> ***NOTE:*** Alpha Codes deleted from the Alpha Code list are deleted only from the list and not from the "data" portion of the database. Hence, previously entered Alpha Codes will be preserved in the database.

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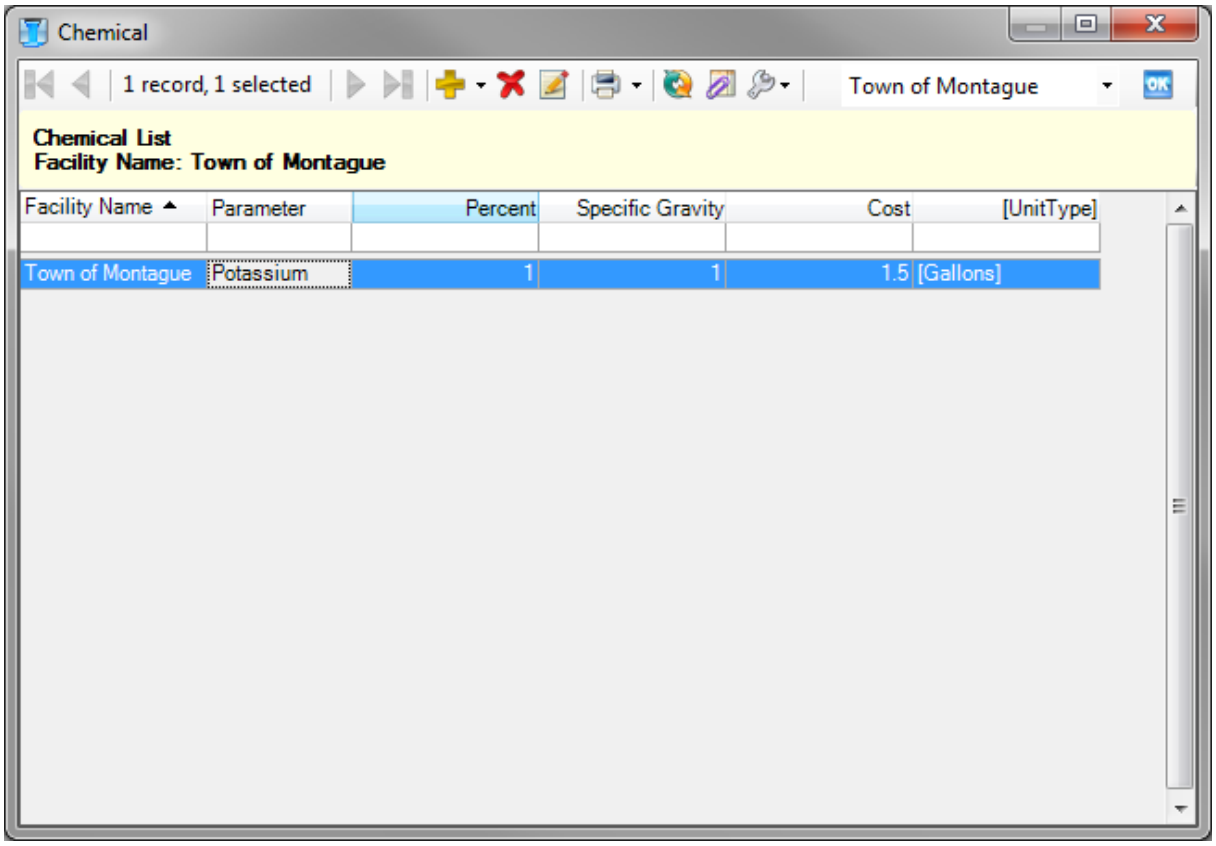
4.11 Chemicals

Chemical

The **Chemical** section allows the User to define chemicals used for the current Facility. Calculations may then be performed for a Process in which chemicals are used, based on Percent Strength, Specific Gravity, and Cost per Pound, Kilogram, Gallon, or Liter.



Accessing the Chemical List

To access the Chemical List, go to the **Setup** ribbon and choose **[Chemicals]** button.

Add Chemical

Users can create add Chemicals to the list, click the **[Add]** button.

Enter the following information:

- **Parameter** - Click the **[...]** button to select from a list of Parameters. Select the Parameter that will be used to store the amount of chemical added to a process.
- **Unit** - Select from the list of available units, all options for Units are displayed.
- **Percent Strength** - Enter the Percent Strength of the chemical being applied.

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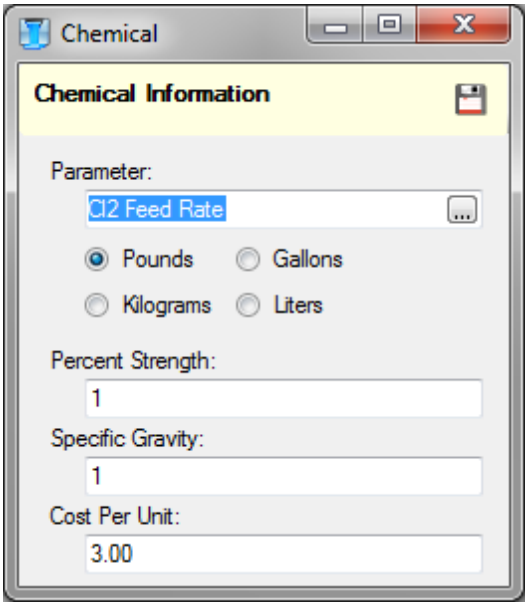
- **Specific Gravity** - Enter the Specific Gravity of the chemical being applied.
- **Cost Per Unit** - Enter the Cost Per Unit of the chemical being applied.

Click the **[Save]** button to complete the process.



Delete Chemical

Users can delete Chemicals as needed; with an Chemical selected, click the **[Delete]** button. Confirm the deletion of data by clicking the Yes **[Yes]** or No **[No]** button.

4.12 Barcode Labels

Barcode Labels

Barcode Label Templates can be created and used to print labels with barcodes suitable for use with the DataPort Handheld Data Entry tool. The barcode labels can be managed and optimized for printing to selected label styles and printers. Four categories of barcode labels can be printed:

- Facility
- Location
- Parameter
- Location:Parameter

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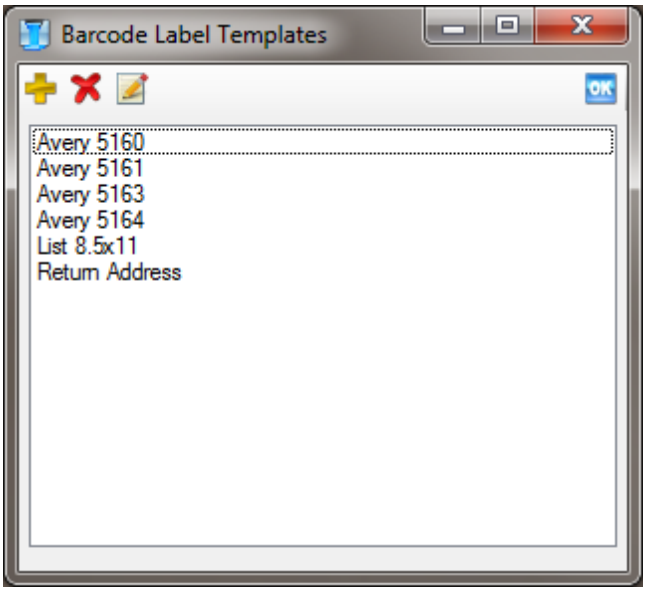

Accessing Barcode Label Templates

To access the Barcode Label Templates section, go to the **Setup** ribbon/menu and choose [labels List] from the ribbon.

Creating Barcodes

In the Barcode Label Templates window, press the **[Add]** button to create a new template. Enter a name for the Barcode Label Template and press OK. After the template has been named, the List and Label Label Designer will open. Edit the label or define label settings using the List and Label designed.

Edit Barcode

On the Labels list, click the **[Edit]** button to open the label editor window. This editor provides many options for customizing the current label, or for creating totally new labels and adding them to the available styles list. Variables and a default barcode are provided that are specific to the Operator10 software.

> ***NOTE:*** For more information regarding the use of the List & Label Report Designer, please consult the List & Label user's manual, which you may access through the main menu's HELP item under the option **Manuals | Report Designer Manual**.

Print Barcode Labels

To print labels using barcode templates defined in the previous topics, go to the **Setup** menu and select the **[Print]** option.

Choose from the drop-down menu, the type of data to be printed on the label. Select

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from **Facility**, **Location**, **Parameter** or **Location:Parameter**. Once an option has been selected, a picklist will open, highlight individual or multiple records and click the OK button to print the selected records as barcodes.

In the next window that opens, select the Barcode Template to be used when printing. Highlight an available template and press OK. Continue with the process by choosing the appropriate options in the **Output To...** window to proceed with the printing of data.

4.12.1 Barcode Template Name

Barcode Template Name

Each barcode must be named. Enter a name for the new barcode and press the OK button.

4.13 Calculations

Calculate

Calculations may be performed for Location:Parameters in the current Facility using all Hourly, Daily, or Monthly formulas or a range of formulas.

Performing a Calculation

There are many ways in which calculations can be performed:

CALCULATE NOW
To immediately calculate formulas for a given database, go to the **Tools** ribbon and click the **[Calculate Now]** button. The following window will appear:

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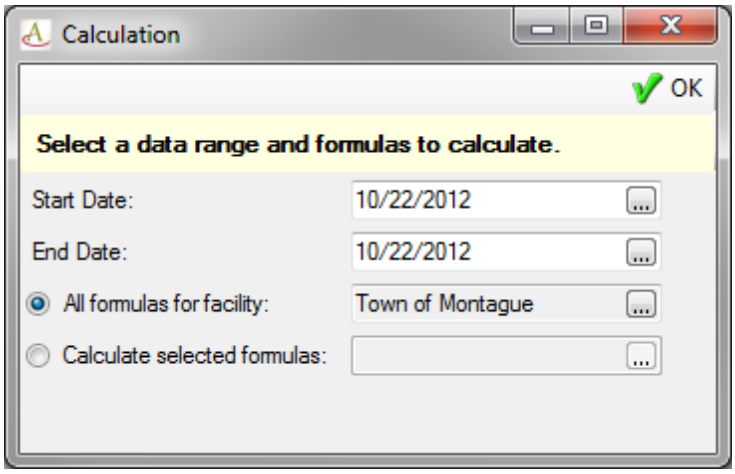

Choose a date range in which the calculations should be applied. Enter appropriate dates or press the **[...]** popup button to choose from a Calendar dialog. Calculations may take several minutes to complete, depending on the number of days, the number of formulas, and the speed of the computer. Calculations will continue in the background while allowing the Windows operating system to continue normally.

NOTE: Relative Dates and the type of calculations selected are restored the next time the dialog is opened.

Calculations take place in the following order:

Hourly Calculations
- By Date
- By Formula Name (in the order they appear in the Formula PickList)
- By Location:Parameter (in the order they appear in the Location:Parameter PickList)

Daily Calculations
- By Date
- By Formula Name (in the order they appear in the Formula PickList)
- By Location:Parameter (in the order they appear in the Location:Parameter PickList)

Monthly Calculations
- By Date
- By Formula Name (in the order they appear in the Formula PickList)
- By Location:Parameter (in the order they appear in the Location:Parameter PickList)

CALCULATE Month-to-Date
To immediately calculate from the first of the month to the current date, click the **[Month-to-Date]** button. Calculations will automatically be performed starting on the first of the current month through the current date.

CALCULATE Previous Month-to-Date
To immediately calculate from the first of the previous month to the current date, click

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the **[Previous Month-to-Date]** button. Calculations will automatically be performed starting on the first of the previous month through the current date.

Scheduling a Calculation

To schedule a calculation routine, using the Operator10 Agent Scheduling tool, see the Scheduled Calculation help topic.

Calculation Order

The order in which calculations are performed is vital in order to avoid missing or non-calculated values based on dependencies. As process calculations and user-written formulas may depend on other calculated values, it is important to maintain proper order.

To view or reorder the current order in which all data is to be calculated, go to the **Tools** ribbon and choose the **[Change Order]** button.

To move the calculations up or down, highlight a listed calculation and single left-click on the record to drag the record to the desired position.

Changes to calculation order should be immediately visible, click the **[OK]** button to save the changes.

4.13.1 Averages

Topics in this section include:

- 4-Day Average
- 7-Day Average
- Average (Mean)
- Flow-Weighted Average
- Geometric Mean
- Rounding Rules
- Standard Deviation

4.13.1.1 4-Day Average

4-Day Average

4-Day Averages are calculated by Operator10 - Wastewater software using the following method:

Data is averaged for groups of 4 consecutive values beginning with the earliest data available. Only valid data is considered. Groups are considered to be in the month only if the day of the last value of the group is in the month. Any additional days (outliers) are ignored.

4-Day Averages of each period are normally calculated by using the arithmetic mean

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(Average). Fecals are calculated using the Geometric Mean.

The **Monthly Average** is the arithmetic mean (average) of each 4-day average.

The **Monthly Maximum** is the maximum of each 4-day average

The **Monthly Minimum** is the minimum of each 4-day average.

4.13.1.2 7-Day Average

7-Day Average

The following 7-Day Averages are calculated by Operator10 - Wastewater software:

Continuous, or Floating - Data is averaged for several overlapping 7-day periods, beginning with the first of the month and continuing each consecutive day of the month until a period reaches the end of the month.

First of Month (28 day) - Data is averaged for four (4) 7-day periods, beginning with the first day of the month. Any additional days are ignored.

First of Month (whole month) - Data is averaged for three (3) 7-day periods, beginning with the first day of the month, and a fourth period extending to the end of the month.

Saturday Rule - Data is averaged for 7-day periods beginning on Sunday and extending though the following Saturday. Periods are considered to be in the month containing the Saturday of the period.

Wednesday Rule - Data is averaged for 7-day periods beginning on Sunday and extending though the following Saturday. Periods are considered to be in the month containing the Wednesday of the period.

Whole Week Rule - Data is averaged for 7-day periods beginning on Sunday and extending though the following Saturday. Periods are considered to be in the month only if the entire period is in the month. Any additional days are ignored.

7-Day Averages of each period are normally calculated by using the arithmetic mean (Average). Some calculations allow the Flow-Weighted Average to be used. Fecals are calculated using the Geometric Mean. **Only days containing valid data are averaged for the period. A period containing no valid data is ignored.**

The **Monthly Average** is the arithmetic mean (average) of each 7-day average.

The **Monthly Maximum** is the maximum of each 7-day average

The **Monthly Minimum** is the minimum of each 7-day average.

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4.13.1.3 Average (Mean)

Average

The following **Averages** are calculated by Operator10 - Wastewater software:

The **Average** is calculated by using the **Arithmetic Mean** for all parameters except fecal parameters. Arithmetic means are calculated by Operator 10® software using the following formula:

Arithmetic Mean =

$$\frac{x_1 + x_2 + x_3 + \ldots + x_n}{n}$$

For fecal parameters, the **Average** is calculated using the **Geometric Mean**. The default fecal parameters include parameters 31614, 31616, 31617, 31679, and 74055. If the standard list of Fecals is not acceptable, **contact AllMax for additional information**.

A **4-Day Average** is calculated according to various 4-Day rules. See: 4-Day Average.

The **Monthly Average** of 4-Day averages is the arithmetic mean (average) of each 4-Day Average.

A **7-Day Average** is calculated according to various 7-Day rules. See: 7-Day Average.

The **Monthly Average** of 7-Day averages is the arithmetic mean (average) of each 7-Day Average.

4.13.1.4 Flow-Weighted Average

Flow-Weighted Average

Flow-weighted averages are calculated by Operator 10® software using the following formula:

Flow-Weighted Average =

$$\frac{\left(\left(x_1 \times flow_1\right) + \left(x_2 \times flow_2\right) + \ldots + \left(x_n \times flow_n\right)\right)}{\left(flow_1 + flow_2 + \ldots + flow_n\right)}$$

Days that contain any unpaired values (a value without a flow, or a flow without a value) or contain no data (blank) are ignored.

NOTE: For loadings, the flow-weighted average is equivalent to the average (arithmetic mean), since daily flow has already been considered.

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4.13.1.5 Geometric Mean

Geometric Mean

Geometric means are calculated by Operator 10® software using the following formula:

Geometric Mean =

$$\sqrt[n]{x_1 \times x_2 \times x_3 \times \ldots \times x_n}$$

An alternate (and equivalent) method for calculation which produces identical results is:

Logarithmic Mean =

$$e^{\left(\frac{\ln(x_1)+\ln(x_2)+\ln(x_3)+\ldots+\ln(x_n)}{n}\right)}$$

Neither method handles negative data values, so **all negative data values are ignored** (considered as blank) in calculations.

A data value of zero (0) produces a geometric mean equal to 0 using the first formula. (It is not possible to calculate using the logarithmic method, since the log of 0 is undefined.) Although the 0 result is mathematically correct, it is not acceptable to some users. Therefore the following options are possible:

- **Use 0 values in calculations:** data values 0, 30, 35, 40 produce a geometric mean of 0. This is the default method of calculation used by the Operator10 software.
- **Treat 0 values as 1 in calculations:** data values 0, 30, 35, 40 produce a geometric mean of 14.3, as if the data values were 1, 30, 35, 40. (This is also the same as using the logarithmic method and using 0 in place of the undefined log.)
- **Ignore 0 values in calculations:** data values 0, 30, 35, 40 produce a geometric mean of 34.8, as if the data values were 30, 35, 40. This treats 0 in the same manner as negative values.

If the default method of calculation is not acceptable, **contact AllMax Software, Inc. for additional information.**

4.13.1.6 Rounding Rules

Rounding Rules

AllMax Software, Inc. Operator10 - Wastewater software uses standard rounding rules for all reported values. Although this rule is usually appropriate, it is not acceptable to some users. Therefore the following options are possible on some Reports:

- **Standard Rounding:** a data value whose non-significant portion is greater than or equal to 5 rounds up, otherwise it rounds down (2.25 to 1 decimal place produces 2.3). **This is the standard rule of rounding used by the Operator10 - Wastewater software.**

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- **Even-Biased Rounding:** a data value whose non-significant portion is greater than 5 rounds up, exactly 5 rounds to the nearest even value, otherwise it rounds down (2.25 to 1 decimal place produces 2.2; 2.35 to 1 decimal place produces 2.4).
- **Truncated Rounding:** a data value's non-significant portion is truncated rather than rounded (2.29 to 1 decimal place produces 2.2).

If the standard rule of rounding is not acceptable, **contact AllMax Software, Inc. for additional information.**

4.13.1.7 Standard Deviation

Standard Deviation

Standard Deviation =

$$\sqrt{\frac{\left(x_1-\frac{x_1+x_2+x_3+\ldots+x_n}{n}\right)^2+\left(x_2-\frac{x_1+x_2+x_3+\ldots+x_n}{n}\right)^2+\ldots+\left(x_n-\frac{x_1+x_2+x_3+\ldots+x_n}{n}\right)^2}{n}}$$

This method is actually the **Population Standard Deviation**, which uses a numerator of n. However, a more accurate method when using samples may be **Sample Standard Deviation**, which uses a numerator of n-1:

$$\sqrt{\frac{\left(x_1-\frac{x_1+x_2+x_3+\ldots+x_n}{n}\right)^2+\left(x_2-\frac{x_1+x_2+x_3+\ldots+x_n}{n}\right)^2+\ldots+\left(x_n-\frac{x_1+x_2+x_3+\ldots+x_n}{n}\right)^2}{n-1}}$$

NOTE: Results may be similar for a large number of samples

Therefore the following options are possible:

- **Use Population Standard Deviation as the numerator in calculations: data values 28, 30, 30, 32 produce a standard deviation of 1.414. This is the default method of calculation used by the Operator10 software.**
- **Use Sample Standard Deviation as the numerator in calculations: data values 28, 30, 30, 32 produce a standard deviation of 1.633.**

If the default method of calculation is not acceptable, **contact AllMax Software, Inc. for additional information**.

4.14 Logged Documents

Logged Documents

The Logged Documents feature allows users to log versions of documents (DataViews, Graphs and Reports) as they are printed. Logged documents can be reprinted at any time, as they were printed the first time.

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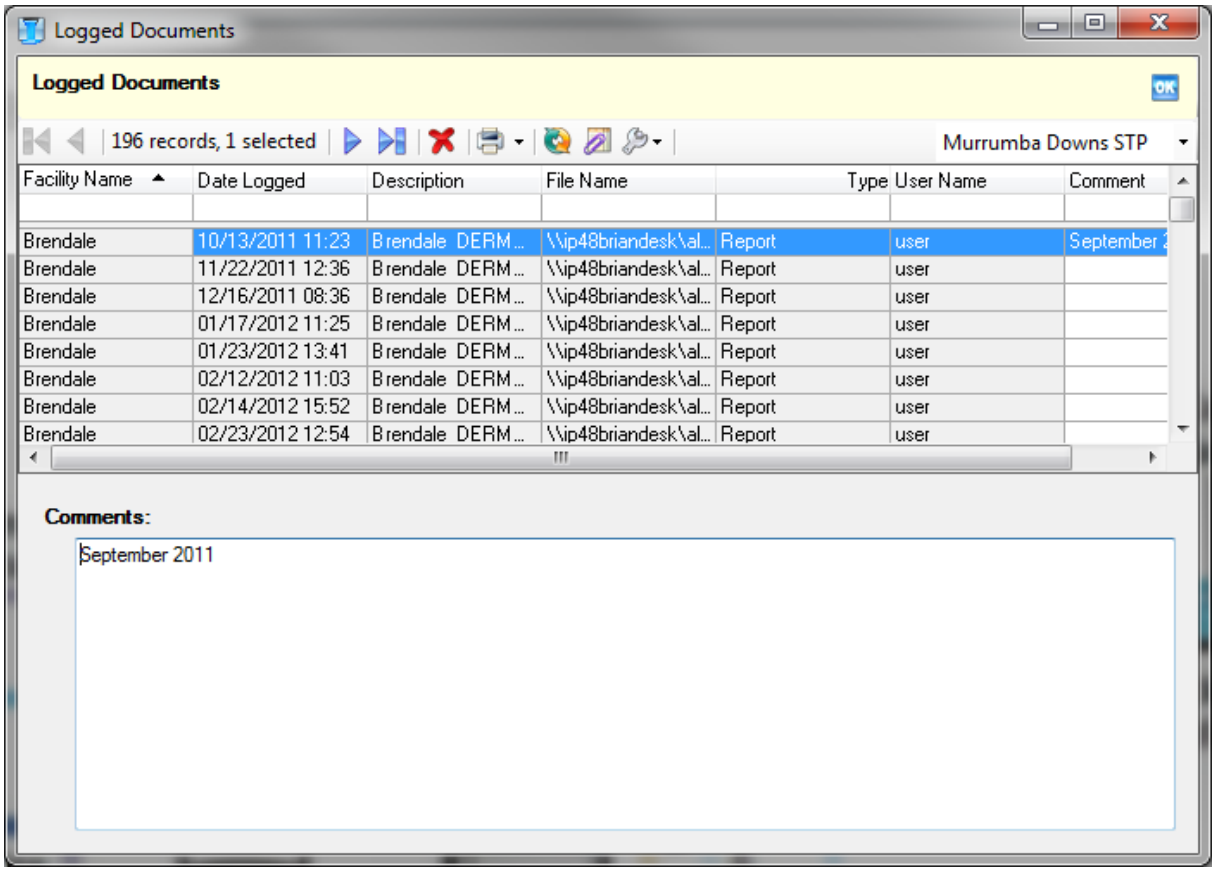
Logged Documents
Logged Documents
196 records, 1 selected
Murrumba Downs STP
Facility Name
Date Logged
Description
File Name
Type
User Name
Comment
Brendale 10/13/2011 11:23 Brendale DERM... \\ip48briandesk\al... Report user September
Brendale 11/22/2011 12:36 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 12/16/2011 08:36 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 01/17/2012 11:25 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 01/23/2012 13:41 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/12/2012 11:03 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/14/2012 15:52 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/23/2012 12:54 Brendale DERM... \\ip48briandesk\al... Report user
Comments:
September 2011

The Logged Documents section allows users to view a list of logged documents printed from the DataView, Graphing and Reporting sections.

Accessing Logged Documents

To access the Logged Document section, in the main application window, go to the **View** ribbon/menu, click the **[View Documents]** button in the Logged Documents group.

Adding Logged Documents

To add new documents to the list of logged documents, go the the DataView, Graphing or Reporting sections of Operator10 and print a document. Upon printing, a prompt may be visible asking for the user to log the document as printed with an associated note.

Depending on the settings found in the Database Properties section, users can edit which sections of the program prompt for logging documents.

Delete Logged Documents

To delete a logged document, highlight the document in the list and click the **[Delete]** button. Confirm the deletion of data by clicking the **[Yes]** or **[No]** button.

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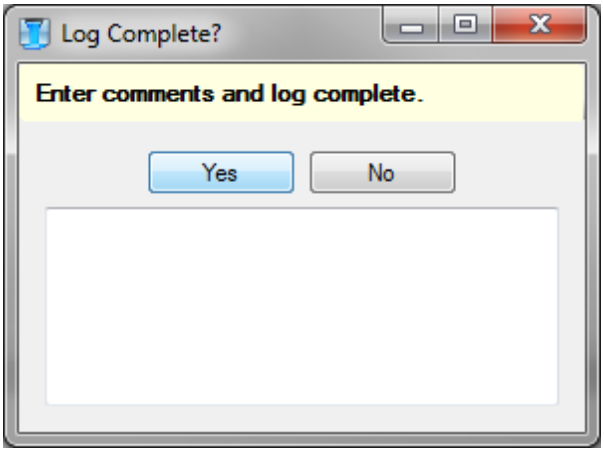
4.14.1 Log Document

Log Document

When users print from DataView, Graphing or Reporting, a prompt will be presented to log documents as complete or printed. Logging a document saves a copy of the document as the document was printed. The logged document is able to be accessed from the Logged Documents section of the program at any time.

When prompted, users can choose to log the document or not, as well as entering a note or comment about the document that has been printed and is being logged.



4.14.2 Logged Documents - All

Logged Documents

The Logged Documents feature allows users to log versions of documents (DataViews, Graphs and Reports) as they are printed. Logged documents can be reprinted at any time, as they were printed the first time.

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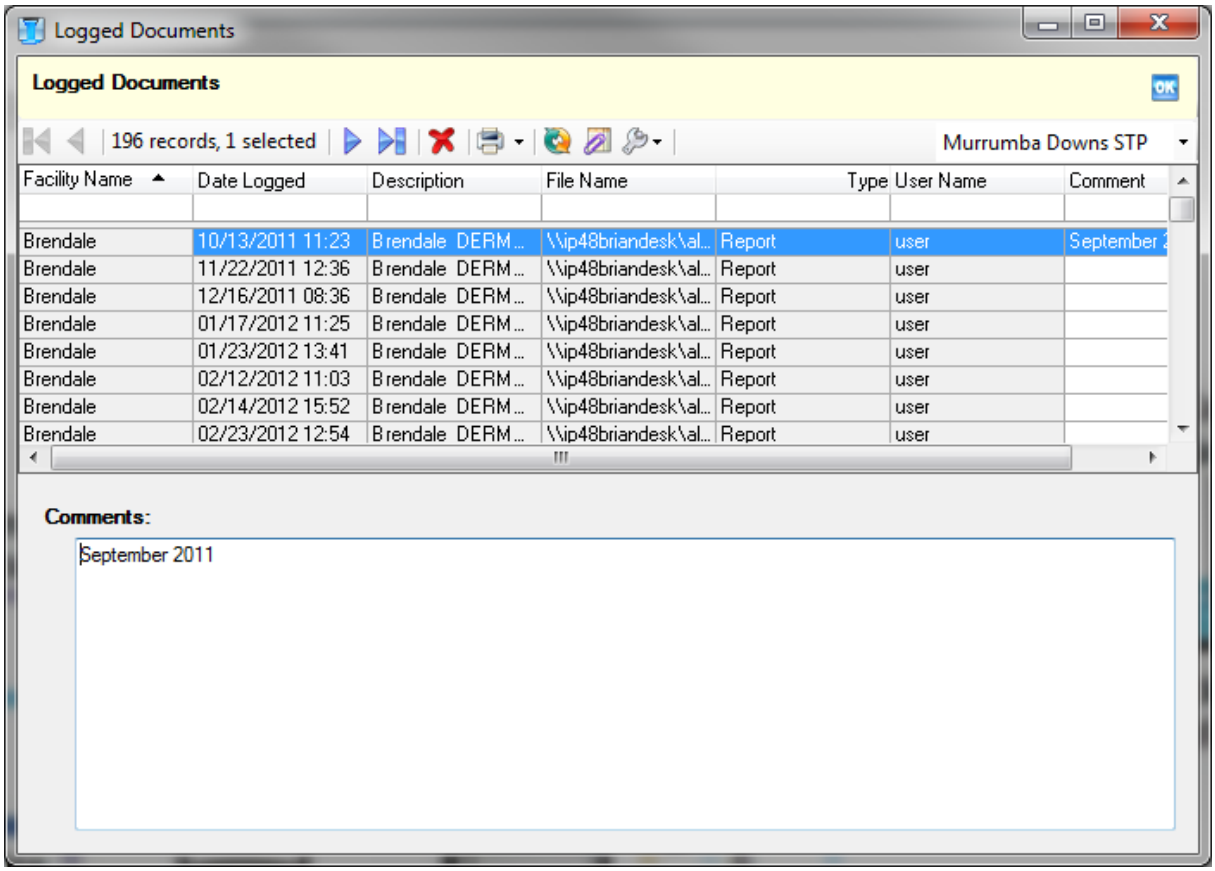
Logged Documents
Logged Documents
196 records, 1 selected
Murrumba Downs STP
Facility Name
Date Logged
Description
File Name
Type
User Name
Comment
Brendale 10/13/2011 11:23 Brendale DERM... \\ip48briandesk\al... Report user September
Brendale 11/22/2011 12:36 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 12/16/2011 08:36 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 01/17/2012 11:25 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 01/23/2012 13:41 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/12/2012 11:03 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/14/2012 15:52 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/23/2012 12:54 Brendale DERM... \\ip48briandesk\al... Report user
Comments:
September 2011

The Logged Documents section allows users to view a list of logged documents printed from the DataView, Graphing and Reporting sections.

Accessing Logged Documents

To access the Logged Document section, go to the View ribbon/menu, click the [View Documents] button in the Logged Documents group.

Adding Logged Documents

To add new documents to the list of logged documents, go the the DataView, Graphing or Reporting sections of Operator10 and print a document. Upon printing, a prompt may be visible asking for the user to log the document as printed with an associated note.

Depending on the settings found in the Database Properties section, users can edit which sections of the program prompt for logging documents.

Delete Logged Documents

To delete a logged document, highlight the document in the list and click the [Delete] button. Confirm the deletion of data by clicking the [Yes] or [No] button.

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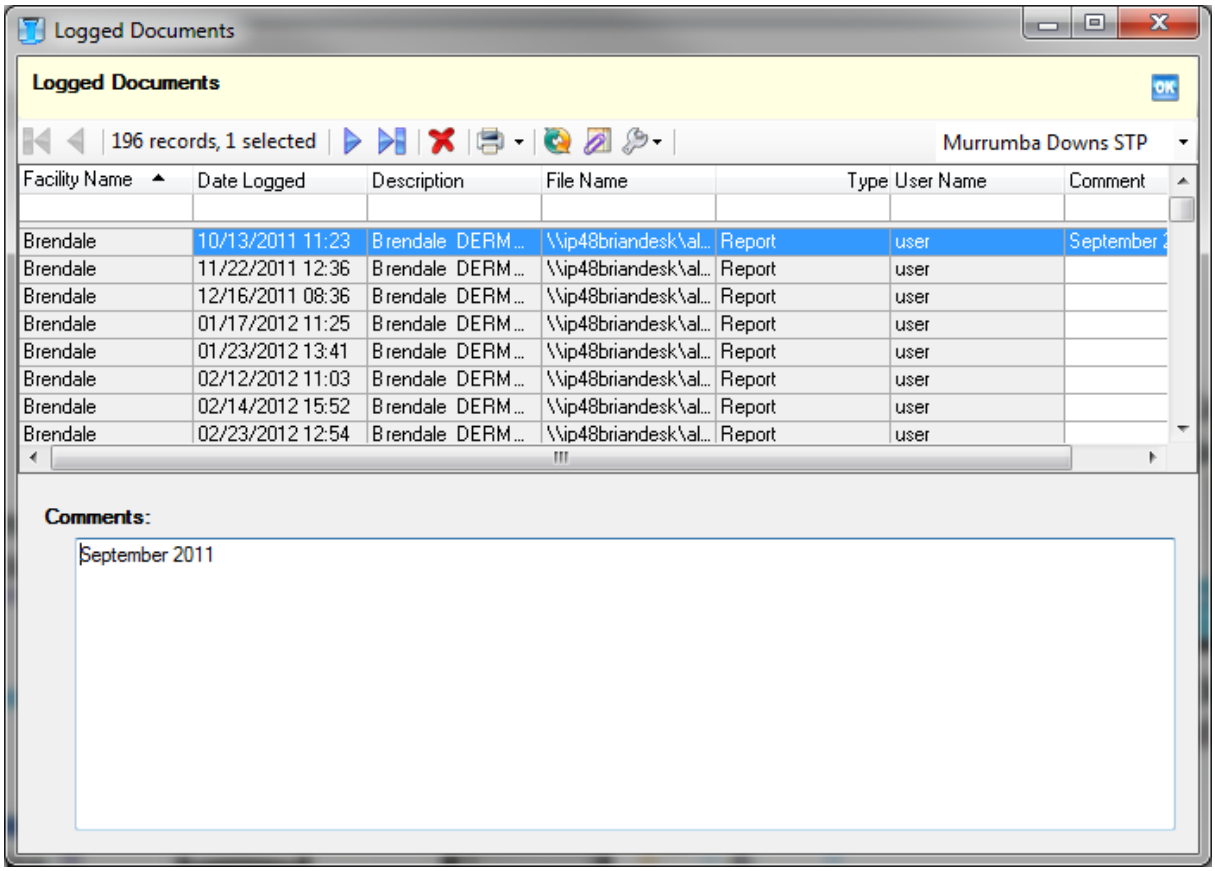
4.14.3 Logged Documents - DataView

Logged Documents

The Logged Documents feature allows users to log versions of documents (DataViews, Graphs and Reports) as they are printed. Logged documents can be reprinted at any time, as they were printed the first time.


Logged Documents
Logged Documents
OK
196 records, 1 selected
Murrumba Downs STP
Facility Name
Date Logged
Description
File Name
Type
User Name
Comment
Brendale 10/13/2011 11:23 Brendale DERM... \\ip48briandesk\al... Report user September
Brendale 11/22/2011 12:36 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 12/16/2011 08:36 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 01/17/2012 11:25 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 01/23/2012 13:41 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/12/2012 11:03 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/14/2012 15:52 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/23/2012 12:54 Brendale DERM... \\ip48briandesk\al... Report user
Comments:
September 2011

The Logged Documents section allows users to view a list of logged documents printed from the DataView, Graphing and Reporting sections.

Accessing Logged Documents

To access the Logged Documents section in the DataView application, go to the **File** menu, click the **Logged Documents** menu option.

Adding Logged Documents

To add new documents to the list of logged documents, go the the DataView, Graphing or Reporting sections of Operator10 and print a document. Upon printing, a prompt may be visible asking for the user to log the document as printed with an associated note.

Depending on the settings found in the Database Properties section, users can edit which sections of the program prompt for logging documents.

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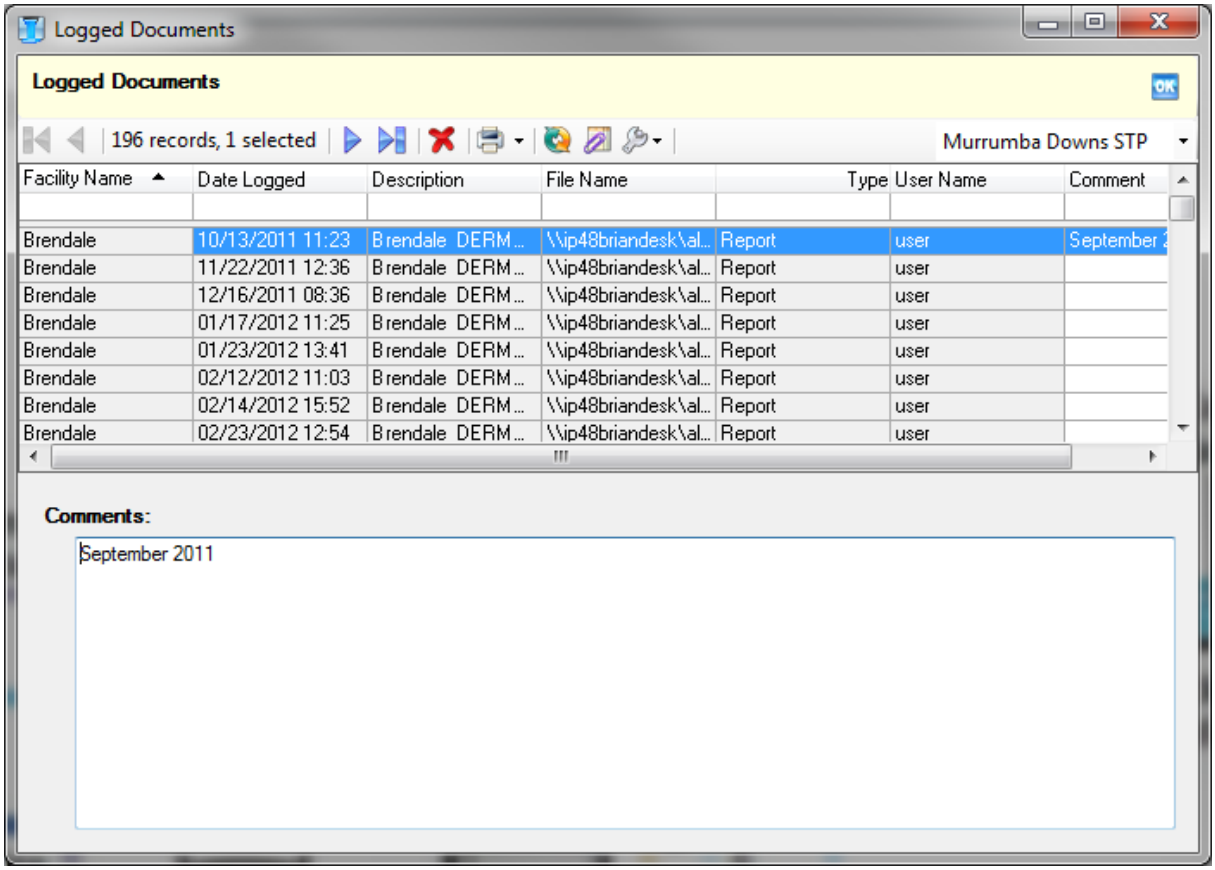
Delete Logged Documents

To delete a logged document, highlight the document in the list and click the **[Delete]** button. Confirm the deletion of data by clicking the **[Yes]** or **[No]** button.

4.14.4 Logged Documents - Report

Logged Documents

The Logged Documents feature allows users to log versions of documents (DataViews, Graphs and Reports) as they are printed. Logged documents can be reprinted at any time, as they were printed the first time.


Logged Documents
Logged Documents
196 records, 1 selected
Murrumba Downs STP
Facility Name
Date Logged
Description
File Name
Type
User Name
Comment
Brendale 10/13/2011 11:23 Brendale DERM... \\ip48briandesk\al... Report user September
Brendale 11/22/2011 12:36 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 12/16/2011 08:36 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 01/17/2012 11:25 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 01/23/2012 13:41 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/12/2012 11:03 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/14/2012 15:52 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/23/2012 12:54 Brendale DERM... \\ip48briandesk\al... Report user
Comments:
September 2011

The Logged Documents section allows users to view a list of logged documents printed from the DataView, Graphing and Reporting sections.

Accessing Logged Documents

To access the Logged Documents section in the Report application, go to the **File** menu, click the **Logged Documents** menu option.

Adding Logged Documents

To add new documents to the list of logged documents, go the the DataView,

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Graphing or Reporting sections of Operator10 and print a document. Upon printing, a prompt may be visible asking for the user to log the document as printed with an associated note.

Depending on the settings found in the Database Properties section, users can edit which sections of the program prompt for logging documents.

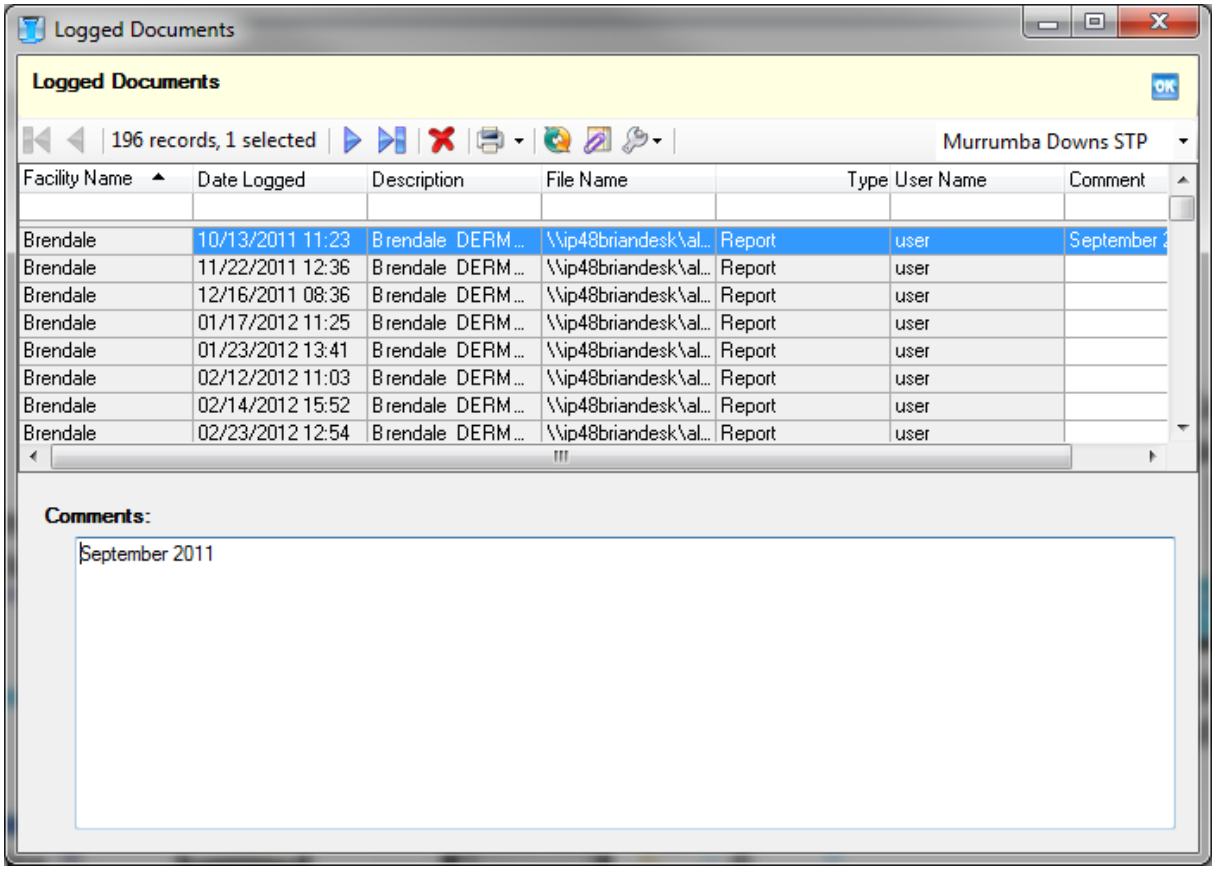
Delete Logged Documents

To delete a logged document, highlight the document in the list and click the [Delete] button. Confirm the deletion of data by clicking the Yes **[Yes]** or No **[No]** button.

4.14.5 Logged Documents - Graph

Logged Documents

The Logged Documents feature allows users to log versions of documents (DataViews, Graphs and Reports) as they are printed. Logged documents can be reprinted at any time, as they were printed the first time.


Logged Documents
Logged Documents
196 records, 1 selected
Murrumba Downs STP
Facility Name
Date Logged
Description
File Name
Type
User Name
Comment
Brendale 10/13/2011 11:23 Brendale DERM... \\ip48briandesk\al... Report user September
Brendale 11/22/2011 12:36 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 12/16/2011 08:36 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 01/17/2012 11:25 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 01/23/2012 13:41 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/12/2012 11:03 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/14/2012 15:52 Brendale DERM... \\ip48briandesk\al... Report user
Brendale 02/23/2012 12:54 Brendale DERM... \\ip48briandesk\al... Report user
Comments:
September 2011

The Logged Documents section allows users to view a list of logged documents printed from the DataView, Graphing and Reporting sections.

Accessing Logged Documents

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To access the Logged Documents section in the DataView application, go to the File menu, click the **Logged Documents** menu option.

Adding Logged Documents

To add new documents to the list of logged documents, go the the DataView, Graphing or Reporting sections of Operator10 and print a document. Upon printing, a prompt may be visible asking for the user to log the document as printed with an associated note.

Depending on the settings found in the Database Properties section, users can edit which sections of the program prompt for logging documents.

Delete Logged Documents

To delete a logged document, highlight the document in the list and click the **[Delete]** button. Confirm the deletion of data by clicking the **[Yes]** or **[No]** button.

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Part V

5 BioSolids

BioSolids

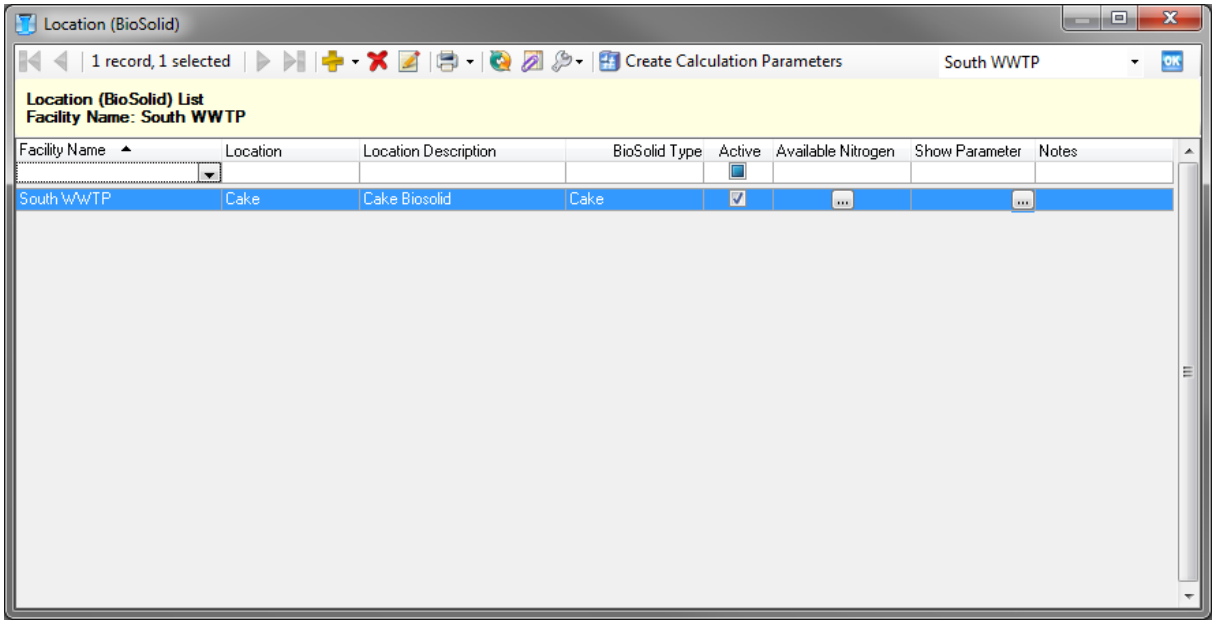
The **BioSolids Ribbon**, visible when licensed for BioSolids, provides access to BioSolids features:

- BioSolids Application
- BioSolids Available Nitrogen
- BioSolids List
- BioSolids Nutrient
- BioSolids Owner
- BioSolids Site
- BioSolids Site Detail
- BioSolids Site Limits

5.1 BioSolids List

BioSolids BioSolid

The BioSolid List displays all BioSolids created in Operator10 - Wastewater. BioSolids are used to track application and loading values to selected Sites.



The BioSolid List displays all defined BioSolids generated at the treatment facility to be applied at Sites.

Accessing the BioSolid list

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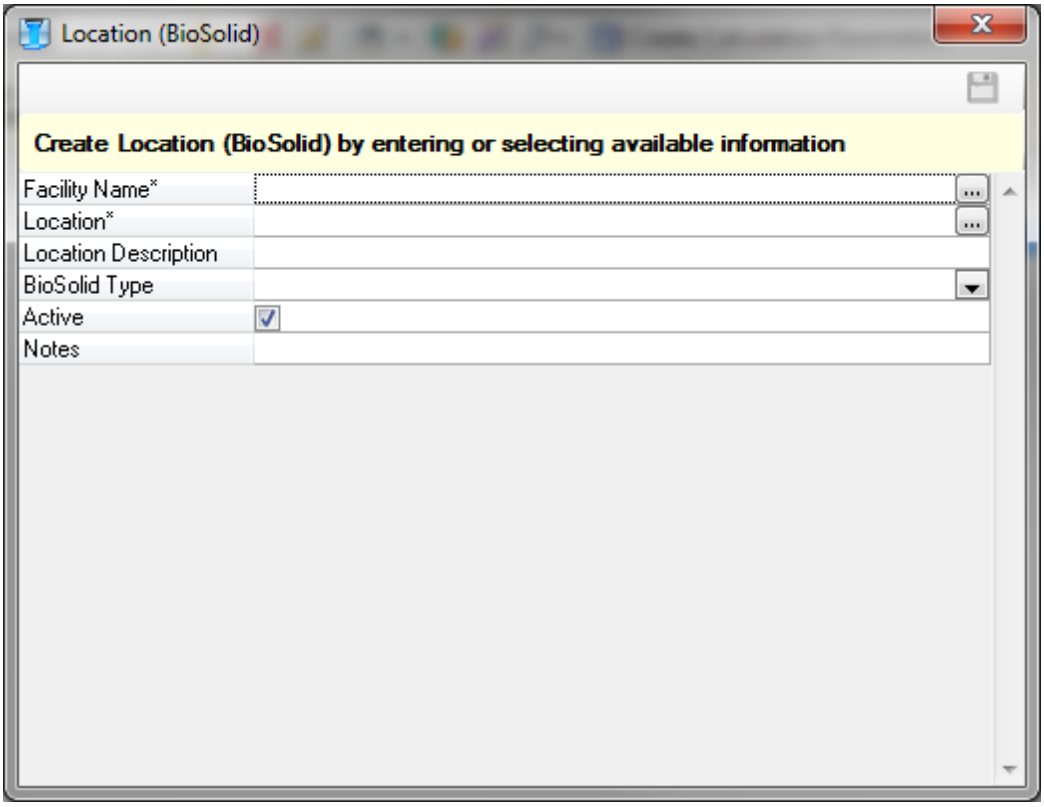
Go to the **BioSolids** ribbon/menu and select **[BioSolids]** to open the BioSolids list.

Add a BioSolid

To create a new **BioSolid**, in the BioSolids List, click the **[Add]** button to add a new BioSolid.

Users will be presented with a Location (BioSolid) window that will allow for data entry of required and optional information. (See below)



Press the **[...]** button to select the **Facility Name** from the Facility list.

Enter a unique **Location** (1 to 16 characters) to identify the BioSolid. A **Description** (0 to 30 characters) may also be entered.

Select the **BioSolid Type** by selecting either **Cake** or **Liquid** from the list of choices.

Check the **[ ] Active** checkbox for BioSolids which are currently in use.

Notes can be entered for a Location, enter text directly into the Notes field.

Click the **[Save]** button to save any data entered.

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Add Similar BioSolid

From the BioSolid list, users are able to create similar BioSolids if one exists. To utilize this feature, highlight an existing BioSolid in the list and click the arrow icon beside the **[Add]** button to select **Add Similar Location (BioSolid)**.

> ***NOTE:*** The Location list and Location editor window have the general properties of the Grid and Grid Edit windows. (For more information about these sections, please see the topic: Grid Functionality).

Add/Assign Parameters

Parameters, tests or samples collected at the respective BioSolid, can be added to the BioSolid.

Using the **[Add]** button secondary menu (the drop-down menu arrow or split button), select the option **Add Parameters** or from the BioSolid list, click the **[...]** button that appears in the column titled "Show Parameters" to begin adding parameters to a selected BioSolid.

In the "Assigned Parameter" list that appears, users can begin to add parameters to the list as needed. Click the **[Add]** button to begin adding parameters.

Once selected, Location:Parameter information can be edited. In-grid editing is possible by entering data where permitted. Multiple-record editing is also permitted. Highlight a group of records to be edited together and click the [Edit] button to begin editing.

Items able to be edited include: **Upper Limit**, **Lower Limit**, **Formula**, **Entry Type** and **Protected**. For more information, see Location:Parameter.

Select from available **Calc Options** to determine how the parameter data is to be used for calculation of daily values for BioSolids Applications. Choose from the drop-down list box the appropriate method by which the data should be obtained.

- **None** - Data values for this Parameter are not used in BioSolids calculations
- **Same Day** - Use values only from the same day as the Application
- **Month Avg** - Average the values for the same month as the Application
- **Next** - Looks forward (beginning with the Application date) to find the next value
- **Previous** - Looks backward (beginning with the Application date) to find the previous value
- **Prev (2, 3, or 4) Avg** - looks backward until (2, 3, or 4) previous values are found, then uses the average

> ***NOTE:*** Hourly data is not available for BioSolids.

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Available Nitrogen

In the BioSolid list, press the **[...]** button in the **Available Nitrogen** column to set up percentages for **Plant Available Nitrogen**. (see: Available Nitrogen)

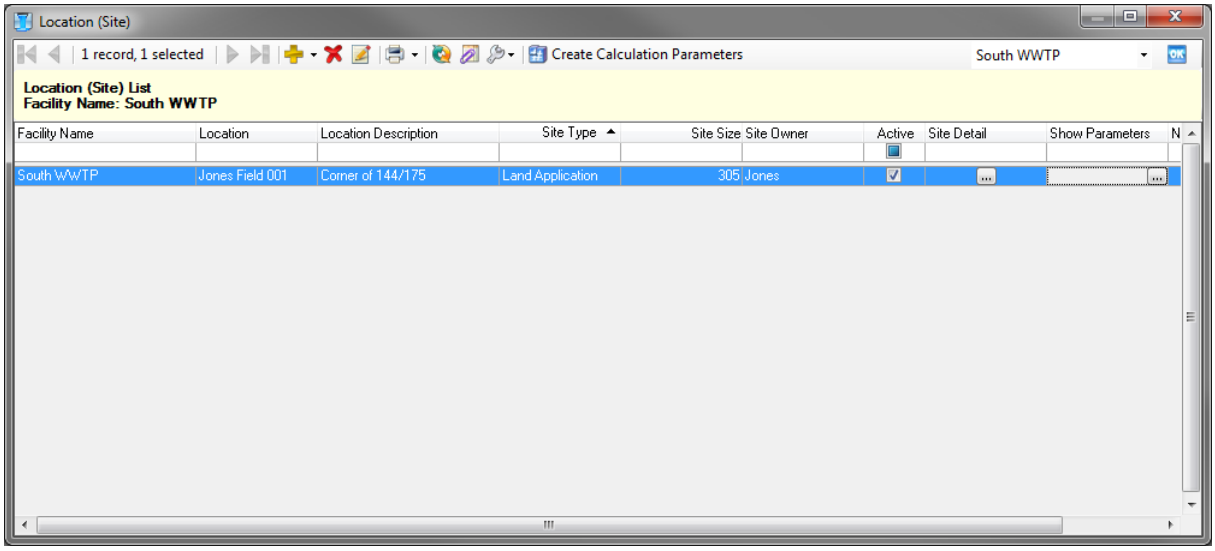
Create Calculation Parameters

In the BioSolid list, press the **Create Calculation Parameters** button to create the Application Parameters for the current BioSolid.

5.2 BioSolids Sites

BioSolids Site

The BioSolid Site list displays all sites (or fields) used to track applications of defined BioSolids. The Site List, shown below, shows users the number of sites available as well as allows for the definition of parameters or test measured at the sites. Based on applications of known BioSolids, users can genereate Site Limits to aid in the determination of correct application to meet permit requirements. To access the BioSolids Site List, go to the BioSolids menu and select Site List... from the menu.



The BioSolid Site List displays all sites (fields) and related information where BioSolids are to be applied.

Accessing the Site List

Go to the **BioSolids** ribbon/menu and choose **[Site List]** button to open the Site List.

Site Detail

Press the **[...]** button to set up additional Site information using the **Site Detail Editor**. See the Site Details Help Topic for more information.

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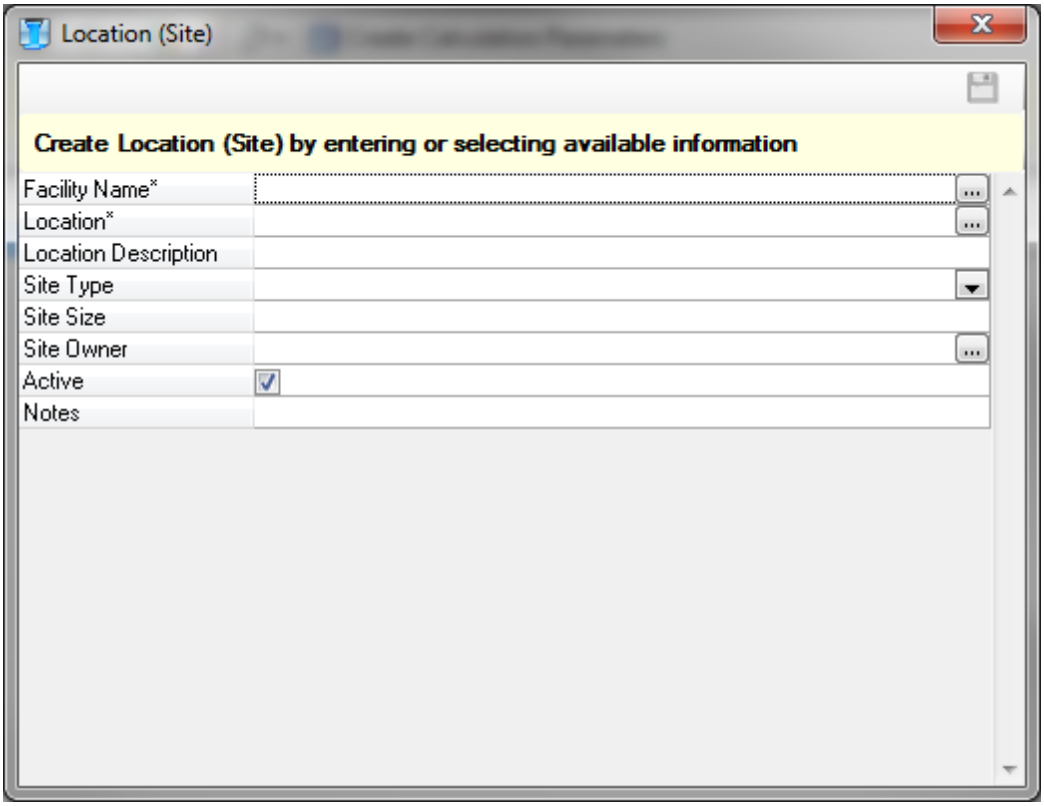
Add a Site

To create a new Site, in the Site List, click the **[Add]** button to add a new Site.

Users will be presented with a **Location (Site)** window that will allow for data entry of required and optional information. (See below)



Select a **Facility** from from the list, press the **[...]** button to open the Facility list for selection.

Enter a unique **Location** (1 to 16 characters) to identify the Site. A **Description** (0 to 30 characters) may also be entered.

Select the **Site Type** by selecting either **Land Application**, **Surface Disposal**, **Incineration** or **Other** from the list of choices.

Site **Area** (*in Acres*) for the current site should be entered in the field.

Check the **[ ] Active** checkbox for Sites which are currently in use.

Notes can be entered for a Site, enter text directly into the Notes field.

Click the **[Save]** button to save any data entered.

Add Similar Site

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From the Site list, users are able to create similar Sites if one exists. To utilize this feature, highlight an existing Site in the list and click the arrow icon beside the **Add** button to select **Add Similar Location (Site)**.

> ***NOTE:*** The Site list and Site editor window have the general properties of the Grid and Grid Edit windows. (For more information about these sections, please see the topic: Grid Functionality).

Add/Assign Parameters

Parameters, tests or samples collected at the respective Site, can be added to the BioSolid.

Using the **[Add]** button secondary menu (the drop-down menu arrow or split button), select the option **Add Parameters** or from the BioSolid list, click the **[...]** button that appears in the column titled "Show Parameters" to begin adding parameters to a selected BioSolid.

In the "Assigned Parameter" list that appears, users can begin to add parameters to the list as needed. Click the **[Add]** button to begin adding parameters.

Once selected, Location:Parameter information can be edited. In-grid editing is possible by entering data where permitted. Multiple-record editing is also permitted. Highlight a group of records to be edited together and click the [Edit] button to begin editing.

Items able to be edited include: **Upper Limit**, **Lower Limit**, **Formula**, **Entry Type** and **Protected**. For more information, see Location:Parameter.

User Defined Parameters

To establish a set of parameters to be considered **User-Defined** and entered at the **BioSolids Application** section, choose an option for **Application Entry** from the list of available options. **User-defined** entries will appear as **User Values** in the BioSolids Application Editor, where values are entered by the user. Summaries will be calculated and stored as Daily Data values for the chosen Parameter. Choose the **Summary Type** from the dropdown List box. A **Parameter** (1 to 16 characters) should be chosen from a PickList by pressing the **[...]** popup button.

> ***NOTE:*** Hourly data is not available for BioSolids Sites.

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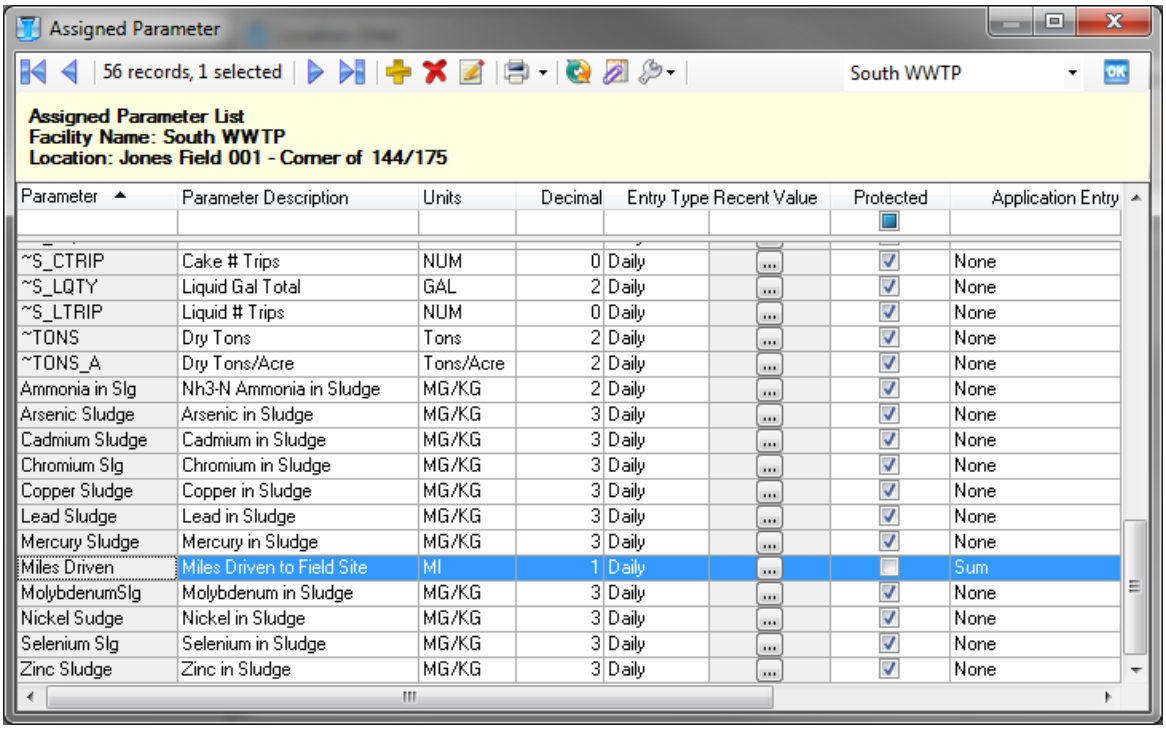

Parameter	Parameter Description	Units	Decimal	Entry Type	Recent Value	Protected	Application Entry
~S_CTRIP	Cake # Trips	NUM	0	Daily	...	☑	None
~S_LQTY	Liquid Gal Total	GAL	2	Daily	...	☑	None
~S_LTRIP	Liquid # Trips	NUM	0	Daily	...	☑	None
~TONS	Dry Tons	Tons	2	Daily	...	☑	None
~TONS_A	Dry Tons/Acre	Tons/Acre	2	Daily	...	☑	None
Ammonia in Slg	Nh3-N Ammonia in Sludge	MG/KG	2	Daily	...	☑	None
Arsenic Sludge	Arsenic in Sludge	MG/KG	3	Daily	...	☑	None
Cadmium Sludge	Cadmium in Sludge	MG/KG	3	Daily	...	☑	None
Chromium Slg	Chromium in Sludge	MG/KG	3	Daily	...	☑	None
Copper Sludge	Copper in Sludge	MG/KG	3	Daily	...	☑	None
Lead Sludge	Lead in Sludge	MG/KG	3	Daily	...	☑	None
Mercury Sludge	Mercury in Sludge	MG/KG	3	Daily	...	☑	None
Miles Driven	Miles Driven to Field Site	MI	1	Daily	...	☐	Sum
MolybdenumSlg	Molybdenum in Sludge	MG/KG	3	Daily	...	☑	None
Nickel Sudge	Nickel in Sludge	MG/KG	3	Daily	...	☑	None
Selenium Slg	Selenium in Sludge	MG/KG	3	Daily	...	☑	None
Zinc Sludge	Zinc in Sludge	MG/KG	3	Daily	...	☑	None

Create Calculation Parameters

In the Site list (see above), press the **Create Calculation Parameters** button to create the Application Parameters for the current Site. Application parameters created will include the following:

- **~A** parameters to calculate pounds per acre applied
- **~B** parameters to calculate pounds applied
- **~H** parameters to calculate kilograms per hectare
- **Base** parameters for MG/KG (milligram per kilogram) applied
- **Additional** parameters for the calculation of total amounts (Dry Tons, Metric Tons, Trips, Quantity, etc.)

5.2.1 Site Detail

BioSolids Site Detail

The **Site Detail** window displays additional information from the BioSolids Site.

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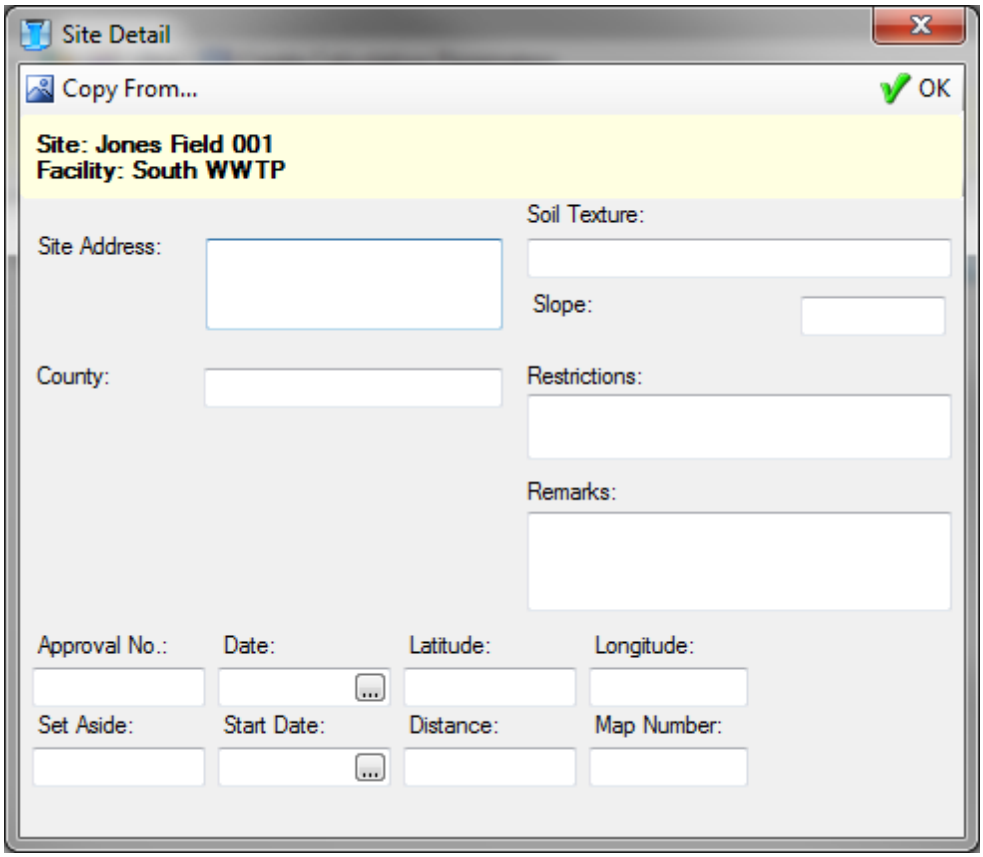

Use **[Copy From...]** to copy all details from another BioSolids Site chosen from a PickList.

The following information is available for entry in the Site Detail Editor:

Site Address
County
Soil Texture
Slope
Restrictions
Remarks
Approval No.
Date
Latitude
Longitude
Set Aside
Start Date
Distance
Distance
Map Number

Click the **[OK]** button to save any data entered.

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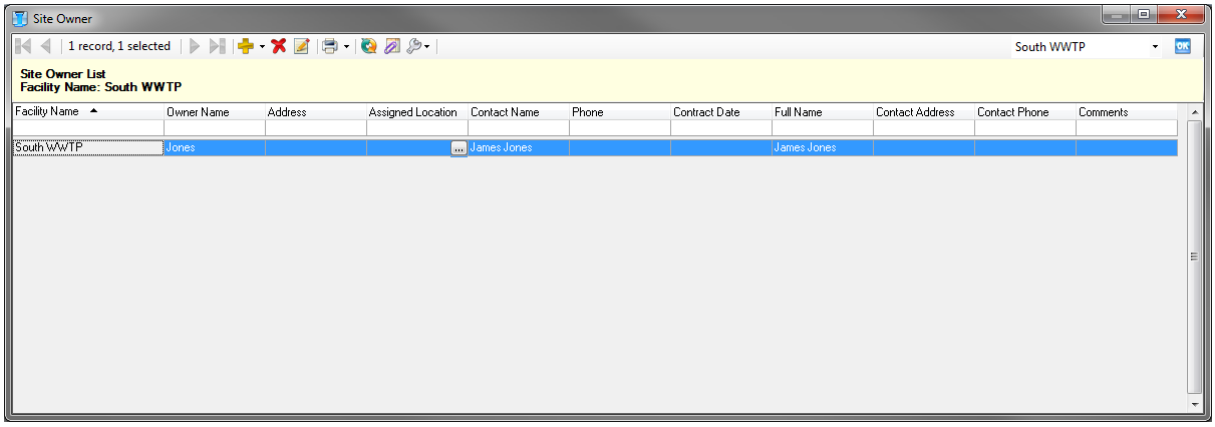
5.3 Site Owner

BioSolids Owner

The Site Owner list displays all defined BioSolid Site Owners and details for each. Owners can be assigned to Sites for management and tracking purposes.



The BioSolid Site Owner List displays all site owners and related information.

Accessing the Owner List

Go to the **BioSolids** ribbon and choose **[Owner List]** to open the Owner List.

Assigned Location

In the Site Owner list, to show all sites which belong to the current Owner, press the **[...]** button in the **Assigned Location** column. A list of assigned Sites will be displayed.

Add Site Owner

To add a new Site Owner, click the **[Add]** button to begin.

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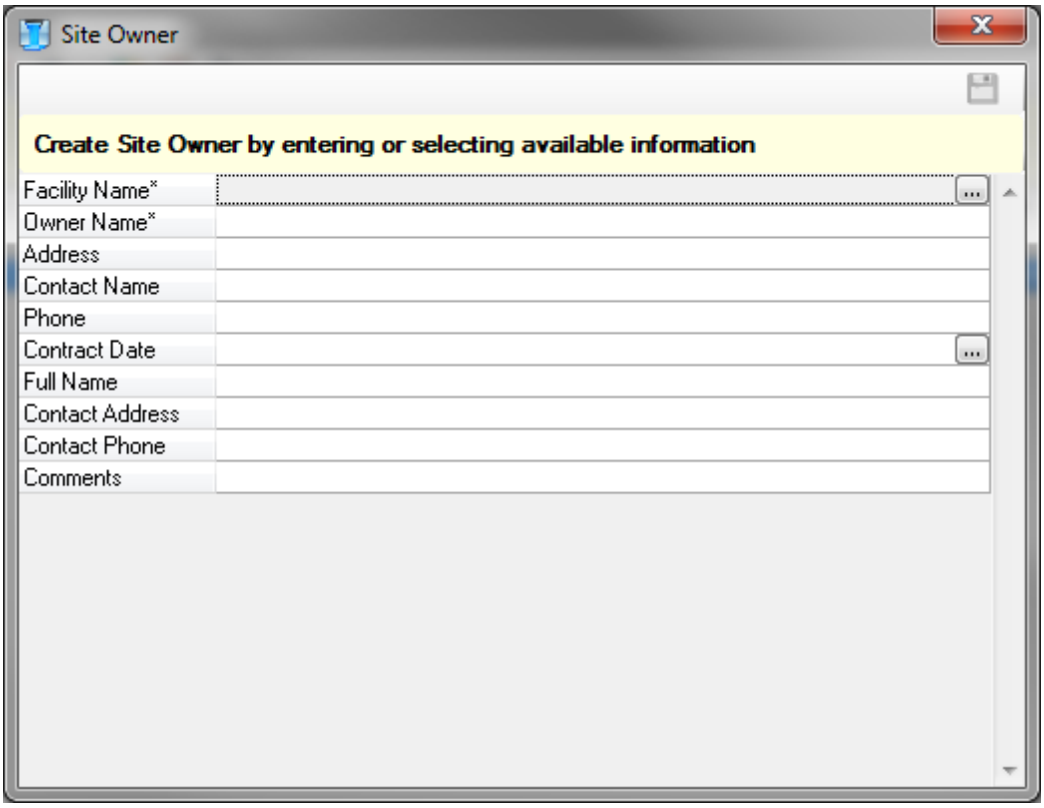

Press the **[...]** button to open and select a Facility from the list.

Enter a unique **Owner Name** (1 to 16 characters) to identify the Owner.

Enter an **Address** for the Site Owner.

Enter a **Contact Name** for the Owner.

Enter a **Phone** number for the Owner.

Enter a **Contract Date** (4 to 8 characters) or use the **[...]** popup button to choose a Date from a Calendar.

Enter appropriate **Owner** information. Information for a Contact Address and Contact Phone may be entered.

Enter Owner **Comments** as required.

5.4 Site Limits

BioSolids Site Limits

BioSolids Site Limits and Nutrient Targets are set for each Site and used for BioSolids Reporting. Limits can be created to maintain requirements for a number of agencies, including federal, state and local. Additionally, limits can be set for field Nutrients and can aid in the determination of benefit of application. To access the Limits section, go to the

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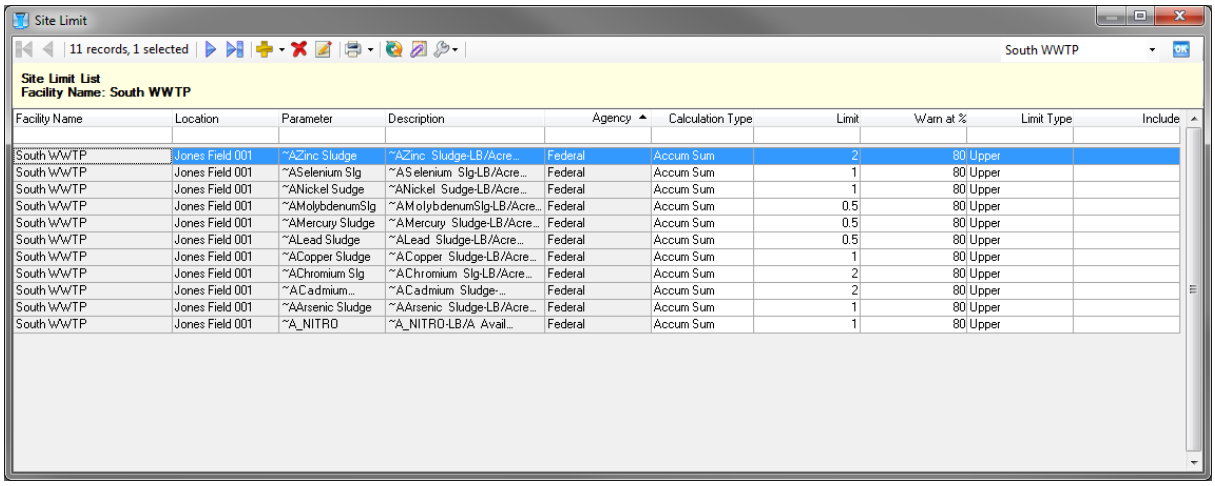
BioSolids menu and choose Limits to begin.


Site Limit
11 records, 1 selected
South WWTP
Site Limit List
Facility Name: South WWTP
Facility Name | Location | Parameter | Description | Agency | Calculation Type | Limit | Warn at % | Limit Type | Include
South WWTP | Jones Field 001 | ~AZinc Sludge | ~AZinc Sludge-LB/Acre... | Federal | Accum Sum | 2 | 80 | Upper
South WWTP | Jones Field 001 | ~ASelenium Slg | ~ASelenium Slg-LB/Acre... | Federal | Accum Sum | 1 | 80 | Upper
South WWTP | Jones Field 001 | ~ANickel Sudge | ~ANickel Sudge-LB/Acre... | Federal | Accum Sum | 1 | 80 | Upper
South WWTP | Jones Field 001 | ~AMolybdenumSlg | ~AMolybdenumSlg-LB/Acre... | Federal | Accum Sum | 0.5 | 80 | Upper
South WWTP | Jones Field 001 | ~AMercury Sludge | ~AMercury Sludge-LB/Acre... | Federal | Accum Sum | 0.5 | 80 | Upper
South WWTP | Jones Field 001 | ~ALead Sludge | ~ALead Sludge-LB/Acre... | Federal | Accum Sum | 0.5 | 80 | Upper
South WWTP | Jones Field 001 | ~ACopper Sludge | ~ACopper Sludge-LB/Acre... | Federal | Accum Sum | 1 | 80 | Upper
South WWTP | Jones Field 001 | ~AChromium Slg | ~AChromium Slg-LB/Acre... | Federal | Accum Sum | 2 | 80 | Upper
South WWTP | Jones Field 001 | ~ACadmium... | ~ACadmium Sludge-... | Federal | Accum Sum | 2 | 80 | Upper
South WWTP | Jones Field 001 | ~AArsenic Sludge | ~AArsenic Sludge-LB/Acre... | Federal | Accum Sum | 1 | 80 | Upper
South WWTP | Jones Field 001 | ~A_NITRO | ~A_NITRO-LB/A Avail... | Federal | Accum Sum | 1 | 80 | Upper

The BioSolid Site Limit List displays all site limits as defined by the user.

Accessing the Site Limits List

To access the Site Limits List, go to the **BioSolids** ribbon/menu and press the **[Limits]** button.

Add Limits

To create a new Limit, in the Site Limit List, click the [Add] button to add a new Limit.

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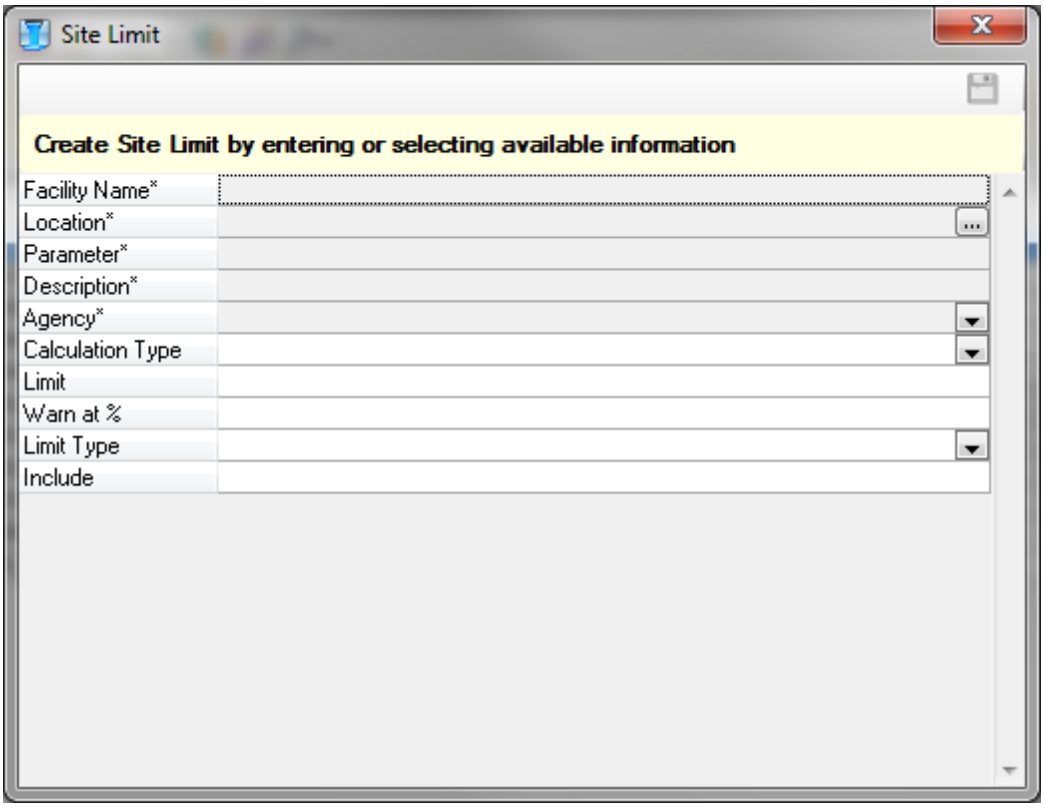

Press the **[...]** button in the **Facility Name** field to choose the facility to add the limit to.

In the Site Limit editor, click the **[...]** button in the Location field to choose a **Location (Site):Parameter** from the list.

Select an **Agency** to associate with this limit. Choose from the available options of: **Federal**, **State**, **Local** or **Nutrient**.

> ***NOTE:*** If the **Nutrient** type is selected, enter a Nutrient Target value in the Limit field.

Select the **Calculation Type** for this limit. Choose from:

- **Accum Sum** - accumulates ALL data for the selected Location:Parameter
- **Year Sum** - accumulates data only for the current calendar year
- **Month Sum** - accumulates data only for the current month
- **Soil Sample** - treats the Limit as a soil sample or entered result, no accumulation is applied
- **Quarter Sum** - accumulates data only for the current quarter

Enter the numeric **Limit** value for the selected Limit. A double asterisk (**) on the reports will signify that the value has exceeded the specified Limit.

If a warning should be noted on the reports, enter a **Warn at %** (a numeric value as a

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percentage to the defined limit). A single asterisk (*) on the reports will signify that the value has exceeded the specified percentage of the Limit.

Select the Limit Type for the selected Limit, choose from **Lower** or **Upper**.

If an additional value (base value, residual, carryover, etc.) is to be considered in the limit, enter a numeric value in the **Include** field.

Add Similar Limit

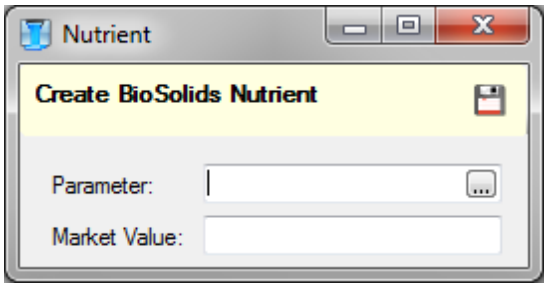
From the Site Limit list, users are able to create similar Limits if one exists. To utilize this feature, highlight an existing Site Limit in the list and click the arrow icon beside the **[Add]** button to select **Add Similar Site Limit**.

NOTE: The Site Limit list and Site Limit editor window have the general properties of the Grid and Grid Edit windows. (For more information about these sections, please see the topic: Grid Functionality).

5.5 Nutrient List

BioSolids Nutrient

The Nutrient List allows users to define any parameters that should be treated as nutrients for a site and will calculate a value based on the entered market value for each nutrient.



Accessing the Nutrient List

Go to the **BioSolids** ribbon and choose **Nutrients** list.

Adding Nutrients

In the Nutrient list, press the **[Add]** button to

Press the **[...]** popup button to choose a Parameter from a PickList.

Enter a **Market Value** for the Parameter, to be used on BioSolids Nutrient Reports.

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Press the **[Save]** button to save the information entered.

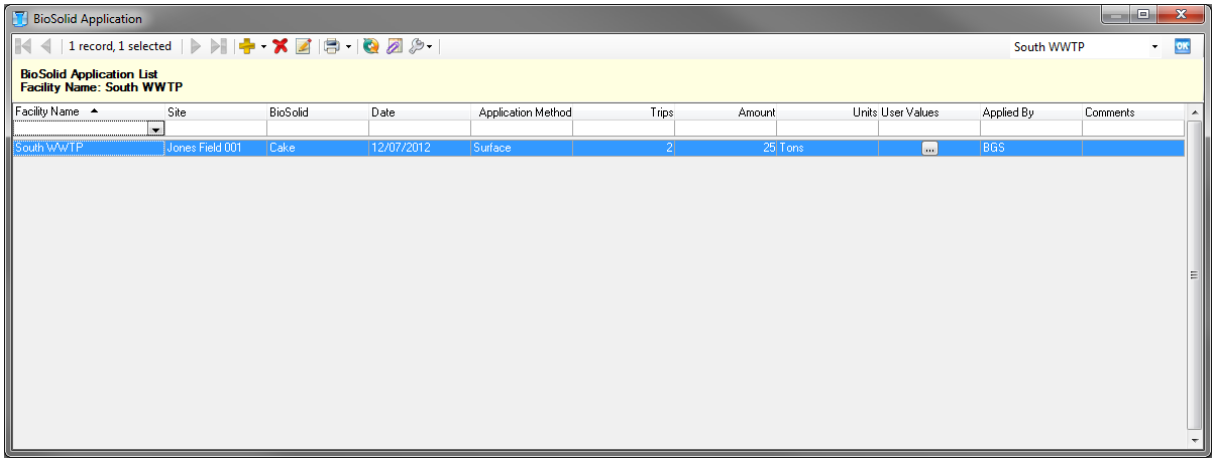
5.6 BioSolids Application

BioSolids Application

A **BioSolids Application** describes the amount of a specific BioSolid applied to a specific Site on a specific day. Application data from applications made to a Site will be used in the calculation of Site data and loadings. Multiple application entries may be made to sites per day for tracking of all applications and data.

Application List

The BioSolids Application list displays all applications of BioSolids to Sites. Users may create new applications from the **BioSolid Application** List window as well as edit existing applications and delete applications as needed.



The BioSolid Application List displays all applied biosolids to sites.

Accessing the Application List

To access the Application List, go to the **BioSolids** ribbon and choose **[Applications]** from the menu.

Add an Application

In the BioSolid Application list, click the **[Add]** button to add a new Application. The window **BioSolid Application** will appear and allow users to enter the following information.

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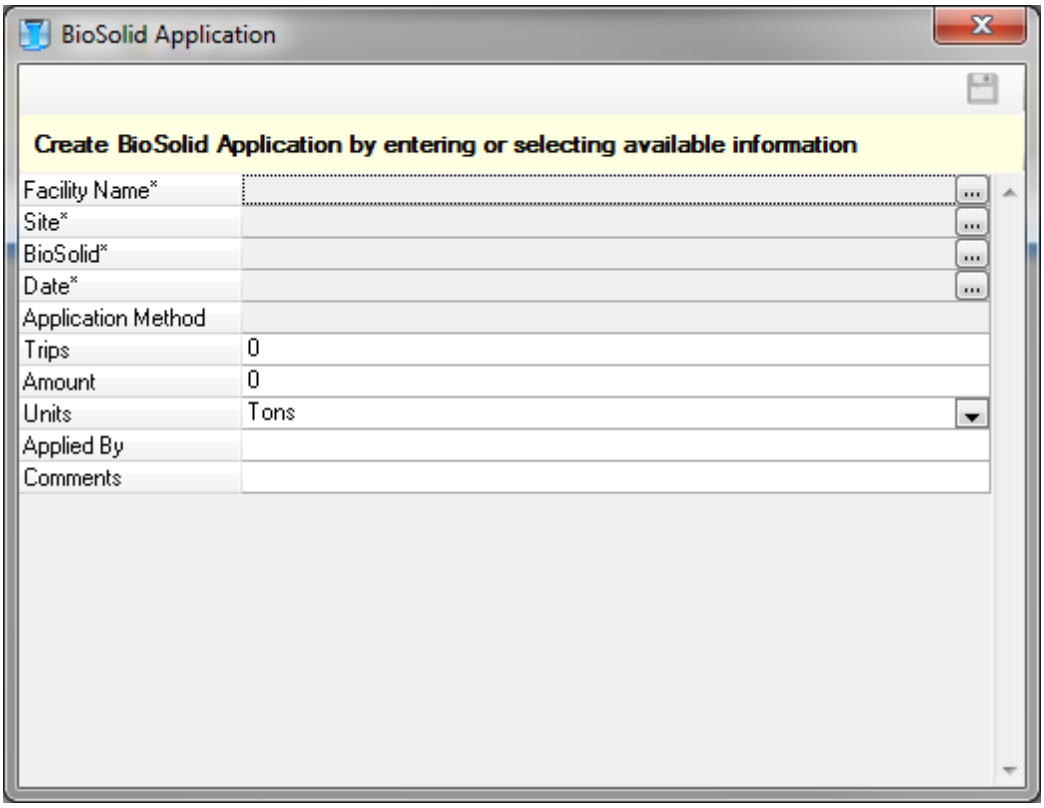

Click the **[...]** button to choose a **Facility Name**.

Click the **[...]** button to choose a **Site** to apply a BioSolid.

Click the **[...]** button to choose a **BioSolid** to apply to a Site.

Click the **[...]** button to choose a **Date** to select a date for application from the calendar.

Select an **Application Method** for this application of a selected BioSolid.

Enter the number of **Trips** made to the selected Site for application.

Enter the **Amount** of BioSolid applied per trip for the application.

Select the **Units** for the Amount of BioSolid applied per trip for the application.

Enter a name or idenitifying value for the user/employee applying the BioSolid in the **Applied By** field.

Enter any comments for the application in the **Comments** field.

Click the **[Save]** button to save any data entered.

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5.6.1 User Values

User Values

In the BioSolid Application List, users may enter specific information about the application, such as Miles Driven, Fuel Usage, etc. as Parameter data. Click the **[...]** popup button in the list entry for an application to enter specific user data about the application. To record values by application, enter a value in the **Data Result** field.

For more information on User-defined fields for Application entry, see the BioSolids Site - User Defined Entry help topic.

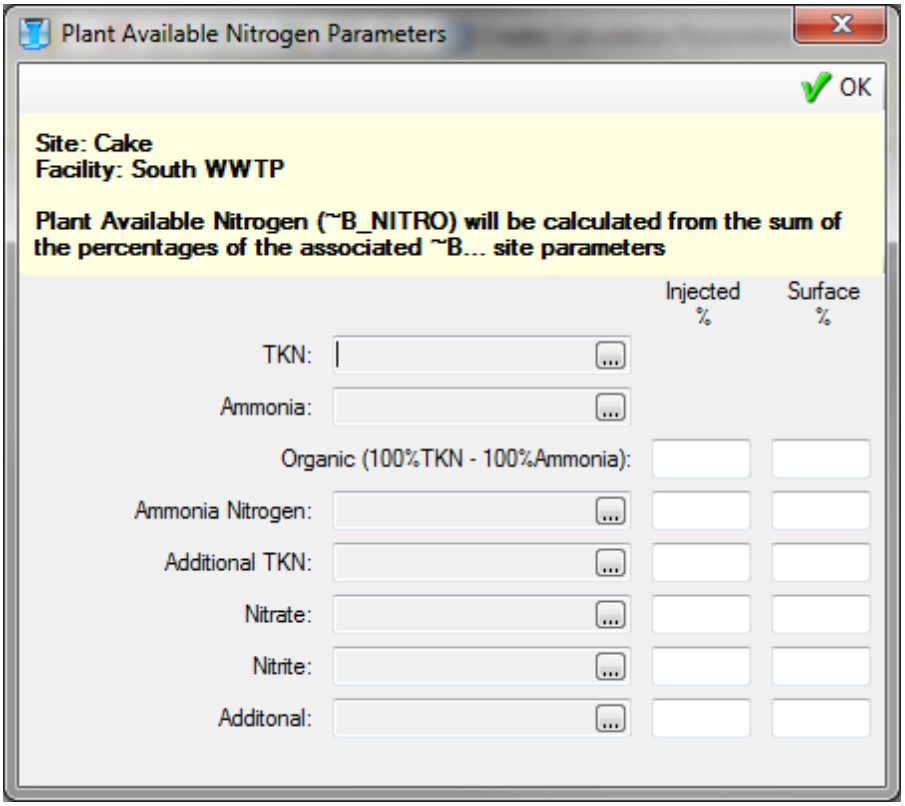
5.7 Available Nitrogen

BioSolids Available Nitrogen

The BioSolids **Plant Available Nitrogen Editor** edits settings for each BioSolid.

Enter information for calculating **Plant Available Nitrogen**. Press the **[...]** popup button to choose a Parameter from a PickList. Enter the **Percentage** of available Nitrogen for **Injected** or **Surface** application. For **Organic**, enter Parameter Names for both **TKN** and **Ammonia**. **Plant Available Nitrogen** will be calculated by adding the percentage of loadings for each specified Parameter.

Click the **[OK]** button to save any data entered.



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Part VI

6 Dashboard

The Dashboard feature of Operator10 - Wastewater allows users to create and manage Views. Views are capable of containing and displaying data as well as links to other features of the Operator10 - Wastewater program.

For more information, see the following topics:

- Views
- Pages
- Page Options and Features

6.1 Views

Views allow the user to combine the functionality of linking to other sections of the program, DataView, Graphs and Reports, as well as to external objects with the ability to highlight individual critical pieces of information using Data Containers, Graph Containers and Gauges. Through the use of Views, users can create Pages to manage each of these sets of information.

Using Pages, users can create specific pages allowing users to link directly to the data entry, reporting and graphing tools of Operator10 - Wastewater. HotSpots can be created over plant overview background images giving life to the plant diagram. Containers can also be added to Pages, allowing the user to view data, via raw data displays and visual gauges and graphs.

For more information, see the following topics:

- Create New View
- View List
- Pages

6.1.1 Create New View

Unlimited Views can be created to manage Pages.

Create New View

To begin the process of creating a new View, access the Dashboard by clicking the **Dashboard** ribbon menu item. In the Dashboard ribbon, locate the **[Create New View]** button and click it.

A new View will be created and will be blank, ready for users to begin adding Pages. To add Pages, please see the following topics:

- Add Page

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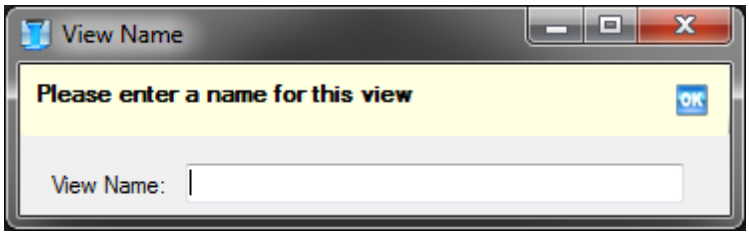
6.1.2 View Name

Saving a View

Once a View is created, users should Save the View to create and name it for future use.

Click the **[Save]** button and choose Save View from the Save menu. If this is a new View, a prompt to name the View will be presented. Enter a name and click the **[OK]** button to save the view.



Save As

Changes made to any View will require a Save. However, users may wish to save the modified View separately as a new, different View. To save an existing view as a new View, choose the **[Save As...]** button from the Save menu.

6.1.3 View List

Multiple Views can be created. In order to manage the list of Views, click the **[Views]** button and choose the **[Open List of Views]** option. In the View list, users can view and open all created views as well as delete Views.

Delete Views

From the View List, select Views (either singularly or in multiple) and click the **[Delete]** button. At the prompt confirm the deletion of the View by click the **[Yes]** or **[No]**.

> ***NOTE:*** Information stored on a View, once deleted is not recoverable.

6.1.4 Pages

Different Pages can be added to provide access to data or links to internal Operator10 - Wastewater sections or external links. Multiple pages can be created for any View, see the following topics for more information.

- Add Page
- Page Features and Options

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6.1.4.1 Add Page

Pages can be added to any view. Follow the step discussed below to add a page.

Add Page

To add a Page, open a View. In the desired View, click the **[Add Page to View]** button to begin. The new Page will be added and allow users to begin adding HotSpots and Containers.

Rename Page

To rename any page/tab, right-click on the desired page/tab to be renamed and choose the **Rename Page...** option.

Enter a new name into the field and click the **[OK]** button to rename the page.

Remove Page

To remove a page from a View, click the small X that appears on the right side of the tab.

A prompt will be displayed confirming the deletion of the Page. Answer appropriately by clicking the **[Yes]** or **[No]** button.

6.1.4.2 Page Options and Features

Pages can be created and added to Views. Pages allow for users to define and display data in various formats as well as providing shortcuts or links to internal items as well as external files.

Pages can be created, for more information, see the following topics:

- Add HotSpots
- Add Containers
- Data Containers
- Graph Containers
- Gauge Containers
- Navigation Containers
- Page Options

6.1.4.2.1 HotSpots

HotSpots allow the user to link to various items, such as DataViews, Report Groups and Graphs created in Operator10 - Wastewater. Additionally, HotSpots can link to external files.

Creating a HotSpot

To create a HotSpot, open a View and on any Page, left-click and drag the cursor over an

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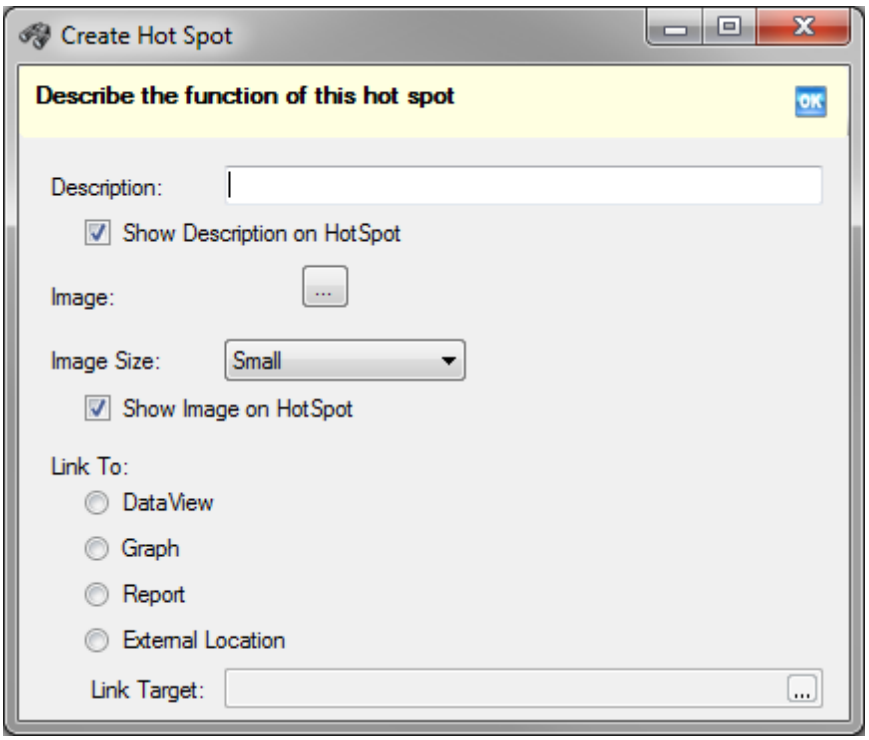
area. This will draw an outline and upon release of the left mouse button, a HotSpot editor will open.



HotSpot Editor

In the HotSpot Editor, enter the following information:

- **Description:** - Enter a description for this HotSpot
  - **[ ] Show Description on HotSpot** - Check this box to display the description of the HotSpot on screen
- **Image:** - Click the **[...]** button to view a list of images to use with the HotSpot
- **Image Size:** - Choose the size of image to be displayed with the HotSpot from the drop-down menu
  - **[ ] Show Image on HotSpot** - Check this box to display the image on the HotSpot
- **Link To:** - Choose from the following options:
  - **( ) DataView:** - Choose the DataView option to open a DataView from the HotSpot
  - **( ) Graph:** - Choose the Graph option to open DataView from the HotSpot
  - **( ) Report:** - Choose the Report option to open a Report Group from the HotSpot
  - **( ) External Location:** - Choose the External Location option to open a file external to Operator10 - Wastewater
  - **Link Target:** - Click the **[...]** button in the Link Target field to browse for the selected type of item to link to; for External Location, the Windows Explorer browse window will open, select an external file to be opened

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With the above information entered, click the **[OK]** button to save the HotSpot.

Editing a HotSpot

To edit a HotSpot, right-click on the HotSpot and choose **Edit HotSpot** from the right-click menu. This will open the HotSpot Editor, see above for more information.

Deleting a HotSpot

To delete a HotSpot, right-click on the HotSpot and choose Delete HotSpot from the right-click menu. This will delete the HotSpot.

6.1.4.2.2 Add Container

Containers allow users to see data based on a selected Location:Parameter as a data table or graphically, like a gauge or graph. Additionally, a navigation container is available to display links to external files.

On any Page users can create, modify and remove selected containers.

Adding Containers

To begin, click the **[Add Container to Page]** button and select from the following:

- **[Add Data Container]** - See the following topic for more information: Data Container
- **[Add Gauge Container]** - See the following topic for more information: Gauge Container
- **[Add Graph Container]** - See the following topic for more information: Graph Container
- **[Add Navigation Container]** - See the following topic for more information: Navigation Container

6.1.4.2.3 Containers

Containers allow users to display data in a graphical way as well as it appears in the database. A container type option is also available to display links to external files.

Topics in this section include:

- Data Containers
- Graph Containers
- Gauge Containers
- Navigation Containers
- Container Size

6.1.4.2.3.1 Data Containers

Data Containers allow users to see a snapshot of data for a single Location:Parameter. Summarized and actual data values for the selected Location:Parameter are displayed

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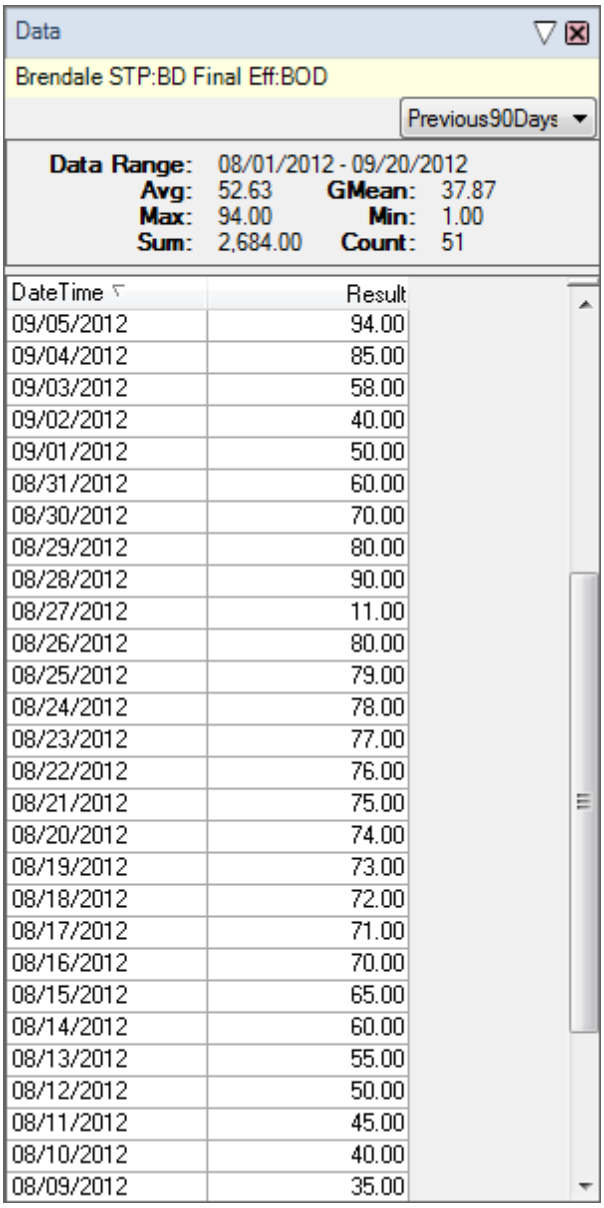
based on the selected date range.



DateTime	Result
09/05/2012	94.00
09/04/2012	85.00
09/03/2012	58.00
09/02/2012	40.00
09/01/2012	50.00
08/31/2012	60.00
08/30/2012	70.00
08/29/2012	80.00
08/28/2012	90.00
08/27/2012	11.00
08/26/2012	80.00
08/25/2012	79.00
08/24/2012	78.00
08/23/2012	77.00
08/22/2012	76.00
08/21/2012	75.00
08/20/2012	74.00
08/19/2012	73.00
08/18/2012	72.00
08/17/2012	71.00
08/16/2012	70.00
08/15/2012	65.00
08/14/2012	60.00
08/13/2012	55.00
08/12/2012	50.00
08/11/2012	45.00
08/10/2012	40.00
08/09/2012	35.00

Sample Data Container

Working with a Data Container

To work with a Data Container, see the following topics.

Adding a Data Container

To add a Data Container, in the Operator10 - Wastewater Main Application, open a Dashboard View and select a Page. With a Page selected, click the button in the ribbon to **[Add Container to Page]** and select **[Add Data Container].**

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The new Data Container will be displayed at the top left of the page and will be blank and ready for setup. Unlimited Data Containers can be added to any Page.

Editing Data Container Settings

Select Location:Parameter

To select the Location:Parameter to be displayed, click the **[Settings]** button at the top right of the Data Container window. From the menu that appears, choose **Select Location:Parameter...** to display the Location:Parameter list. Select the desired Location:Parameter from the list and click the **[OK]** button.

Perform these steps as needed to edit any Data Container at any time.

Set Date Range

To set the date range for the Data Container, use the drop-down menu displayed on the Data Container. Choose from the following options:

- Previous 7 Days
- Current Month
- Previous Month
- Previous 30 Days
- Previous 60 Days
- Previous 90 Days
- Current Year
- Custom

NOTE: Using the **Custom** option will prompt the user for a start and end date. Users can select from dates on the calendar or use the **Relative Date** feature to enter date options that provide a moving range of data from day to day.

Removing a Data Container

To remove a Data Container, click the red X in the top right corner of the Data Container. Answer **[Yes]** or **[No]** to the prompt when presented.

6.1.4.2.3.2 Graph Containers

Graph Containers allow users to see a graph or chart of data for a single Location:Parameter. Data can be graphed using a Line, Horizontal Bar, Vertical Bar or Scatter style based on the selected date range.

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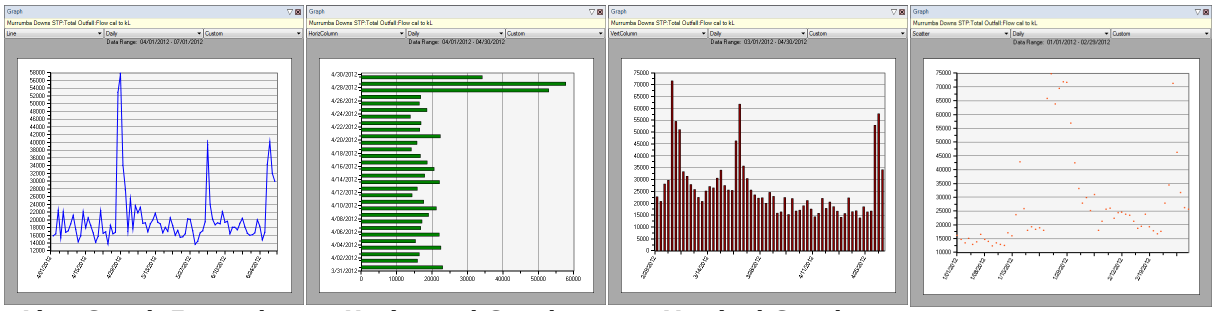

Line Graph Example | Horizontal Graph Example | Vertical Graph Example | Scatter Graph Example

Sample Graph Containers

Working with a Graph Container

To work with a Graph Container, see the following topics.

Adding a Graph Container

To add a Graph Container, in the Operator10 - Wastewater Main Application, open a Dashboard View and select a Page. With a Page selected, click the button in the ribbon to **[Add Container to Page]** and select **[Add Graph Container]**.

The new Graph Container will be displayed at the top left of the page and will be blank and ready for setup. Unlimited Graph Containers can be added to any Page.

Editing Graph Container Settings

Select Location:Parameter

To select the Location:Parameter to be displayed, click the **[Settings]** button at the top right of the Graph Container window. From the menu that appears, choose **Select Location:Parameter...** to display the Location:Parameter list. Select the desired Location:Parameter from the list and click the **[OK]** button.

Perform these steps as needed to edit any Graph Container at any time.

Set Graph Type

To set the type for the Graph Container, in the first drop-down menu that appears on the Graph Container, choose from the following options:

- Line - A connected line graph
- HorizColumn - A horizontal bar chart
- VertColumn - A vertical bar chart
- Scatter - A graph of plotted points, non-connected by a line

Set Graph Data Options

To set the graph data options, choose from the following options in the second

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drop-down menu:

- Hourly - Use this option to graph Hourly data for a selected Hourly Location:Parameter
- Daily - Use this option to graph Daily data for a selected Hourly Location:Parameter
- Monthly[xyz] - Use these options to graph a summarized monthly value for the selected Location:Parameter for the selected Date Range; Monthly Sum, Average, Maximum, Minimum and Count are available for selection
- Yearly[xyz] - Use these options to graph a summarized yearly value for the selected Location:Parameter for the selected Date Range; Yearly Sum, Average, Maximum, Minimum and Count are available for selection

Set Date Range

To set the date range for the Graph Container, use the third drop-down menu displayed on the Graph Container. Choose from the available options. Based on the Graph Data Options, the quick dates displayed will be different. For each, the quick dates are relative to the type of data to be graphed and will provide familiar, easy to understand date options.

The Custom option will be available regardless of the selected Graph Data Option.

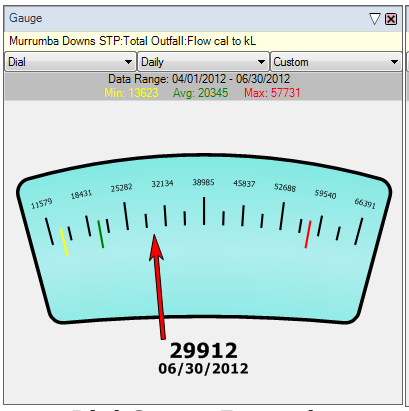
NOTE: Using the Custom option will prompt the user for a start and end date. Users can select from dates on the calendar or use the Relative Date feature to enter date options that provide a moving range of data from day to day.

Removing a Graph Container

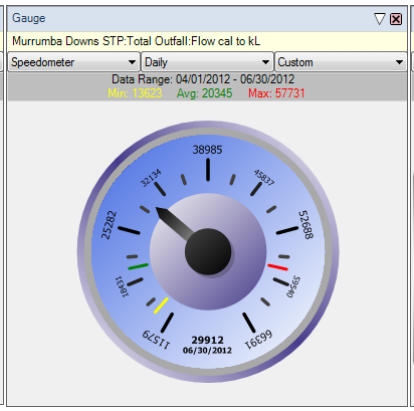
To remove a Graph Container, click the red X in the top right corner of the Graph Container. Answer Yes **[Yes]** or No **[No]** to the prompt when presented.

6.1.4.2.3.3 Gauge Containers

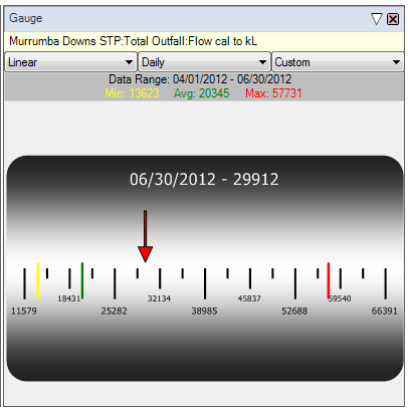
Graph Containers allow users to see a Gauge or chart of data for a single Location:Parameter. Data can be displayed using a Dial, Gauge and Linear style Gauge based on the selected date range.



Dial Gauge Example



Speedometer Gauge Example



Linear Gauge Example

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Sample Gauge Containers

Working with a Gauge Container

To work with a Gauge Container, see the following topics.

Adding a Gauge Container

To add a Gauge Container, in the Operator10 - Wastewater Main Application, open a Dashboard View and select a Page. With a Page selected, click the button in the ribbon to **[Add Container to Page]** and select **[Add Gauge Container]**.

The new Gauge Container will be displayed at the top left of the page and will be blank and ready for setup. Unlimited Gauge Containers can be added to any Page.

Editing Gauge Container Settings

Select Location:Parameter

To select the Location:Parameter to be displayed, click the **[Settings]** button at the top right of the Gauge Container window. From the menu that appears, choose **Select Location:Parameter...** to display the Location:Parameter list. Select the desired Location:Parameter from the list and click the **[OK]** button.

Perform these steps as needed to edit any Gauge Container at any time.

Set Gauge Type

To set the type for the Gauge Container, in the first drop-down menu that appears on the Gauge Container, choose from the following options:

- Dial
- Speedometer
- Linear

Set Gauge Data Options

To set the Gauge data options, choose from the following options in the second drop-down menu:

- Hourly - Use this option to display Hourly data for a selected Hourly Location:Parameter
- Daily - Use this option to display Daily data for a selected Hourly Location:Parameter

Set Date Range

To set the date range for the Gauge Container, use the third drop-down menu displayed on the Gauge Container. Choose from the available options. Based on the

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Gauge Data Options, the quick dates displayed will be different. For each, the quick dates are relative to the type of data to be displayed and will provide familiar, easy to understand date options.

The Custom option will be available regardless of the selected Gauge Data Option.

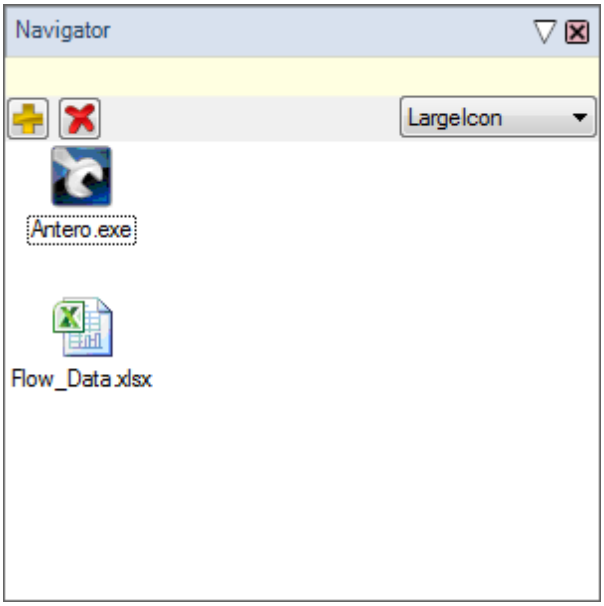
NOTE: Using the Custom option will prompt the user for a start and end date. Users can select from dates on the calendar or use the Relative Date feature to enter date options that provide a moving range of data from day to day.

Removing a Gauge Container

To remove a Gauge Container, click the red X in the top right corner of the Gauge Container. Answer Yes **[Yes]** or No **[No]** to the prompt when presented.

6.1.4.2.3.4 Naviagtion Containers

Navigation Containers allow users to establish a selection of links to external files that may be commonly used or accessed.



Sample Navigation Container

Working with a Navigation Container

To work with a Navigation Container, see the following topics.

Adding a Navigation Container

To add a Navigation Container, in the Operator10 - Wastewater Main Application, open a Dashboard View and select a Page. With a Page selected, click the button in the ribbon to **[Add Container to Page]** and select **[Add Navigation Container]**.

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The new Navigation Container will be displayed at the top left of the page and will be blank and ready for setup. Unlimited Navigation Containers can be added to any Page.

Editing Navigation Container Settings

Adding Links to a Navigation Container

To add links to a Navigation Container, click the **[Add]** button to display an explorer window allowing you to browse for a file and select it to be included in the container.

Removing Links from a Navigation Container

To remove a link from a Navigation Container, single-click a displayed icon or link to highlight it. With a link highlighted, click the **[Delete]** button and the link will be removed.

Set View Options

To set the view options for the Navigation Container, choose from the following options in the drop-down menu:

- Large Icon
- Details
- Small Icon
- List
- Tile

Removing a Navigation Container

To remove a Navigation Container, click the red X in the top right corner of the Navigation Container. Answer

[Yes] or

[No] to the prompt when presented.

6.1.4.2.3.5 Container Size

Dashboard Containers can be sized, as desired, by users. To set the container size, choose from available preset sizes or define a custom size.

Adjusting Container Size

To set the size of a container, click on the **[Settings]** button at the top right of the container. From the menu that is displayed, choose the **Window Size...** option and select from the available choices. Default sizes are provided and maintained by Operator10 - Wastewater.

Choose the option **Custom Size...** to define a custom size for the Container. Enter a numeric value in the **Height** and **Width** fields or use the up/down arrow buttons to

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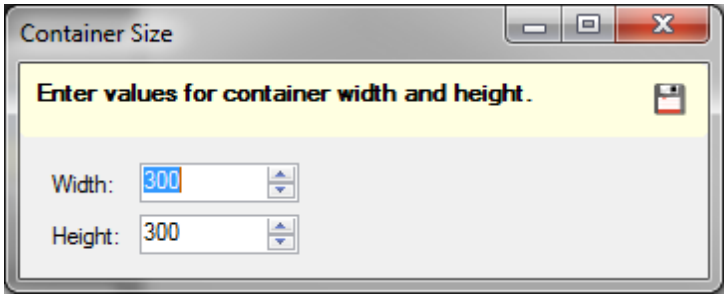
adjust the size.

Press the **[Save]** button to set the size of the container.

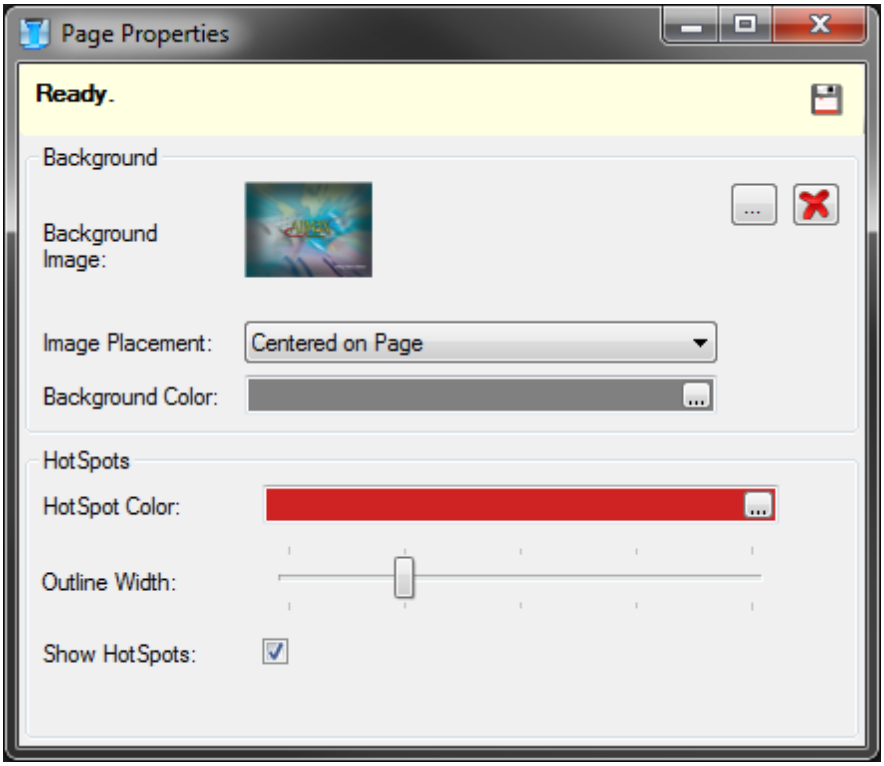


6.1.4.2.4 Page Options

For each Page, the following options are available.

Page Options

To access Page Options, click the **[Page Options]** icon in the Dashboard Ribbon. The **Page Properties** window will open and is shown below.



Background Image

Each Page has the ability to store a background image.

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Select Background Image

To set the background image, press the **[...]** button. From the browser window that opens, select the appropriate image file (JPG, PNG and BMP files) and the selected image will display as the background image.

Delete Background Image

To delete the background image for the selected Page, press the **[Delete Background Image...]** button. This will delete the background image.

Image Placement

To choose the placement of the background image, use the drop-down menu to select from the available choices. Options include:

- Top Left Corner
- Centered on Page
- Fit to Page Size

Background Color

To set the color of the background, press the **[...]** button and user the color picker to choose a background color.

HotSpots

The following HotSpot options are available for each Page.

HotSpot Color

To set the color of the border for the HotSpots displayed on the selected Page, press the **[...]** button and user the color picker to choose a background color.

Outline Width

To set the width of the border lines for the HotSpots displayed on the selected Page, use the slider to choose the appropriate thickness

Show HotSpots

To display the HotSpots for a Page, place a checkbox in the **Show HotSpots** option.

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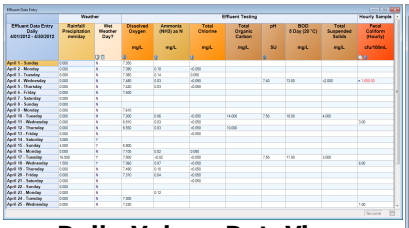
Part VII

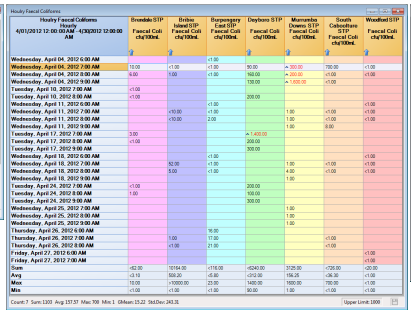
7 DataView

DataViews are the spreadsheet-style grids where data is entered, viewed , imported, exported, or printed. Columns represent Facility:Location:Parameters and Rows represent dates or summary information. DataViews may be setup with various combinations of headers, footers, parameters, and summaries.

Unlimited DataViews can be created giving users the ability to truly customize their access to the data stored within Operator10 - Wastewater.



Daily Values DataView



Hourly Values DataView

Summary Values DataView

Accessing DataViews

- Individual DataViews can be accessed using HotSpots from the Dashboard
- In the Main Application window, go to the View ribbon and click the **[DataView List]** button to open the DataView List
- In the Main Application window, go to the View ribbon and click the **[New DataView]** button to create a new DataView

DataView Types

The DataView application provides users with the ability to create 3 unique types of view capable of providing data entry and review:

- Daily Values DataView
- Hourly Values DataView
- Summary Values DataView

Additional Topics

View the following topics for additional information:

- DataView Data Entry
- DataView Properties

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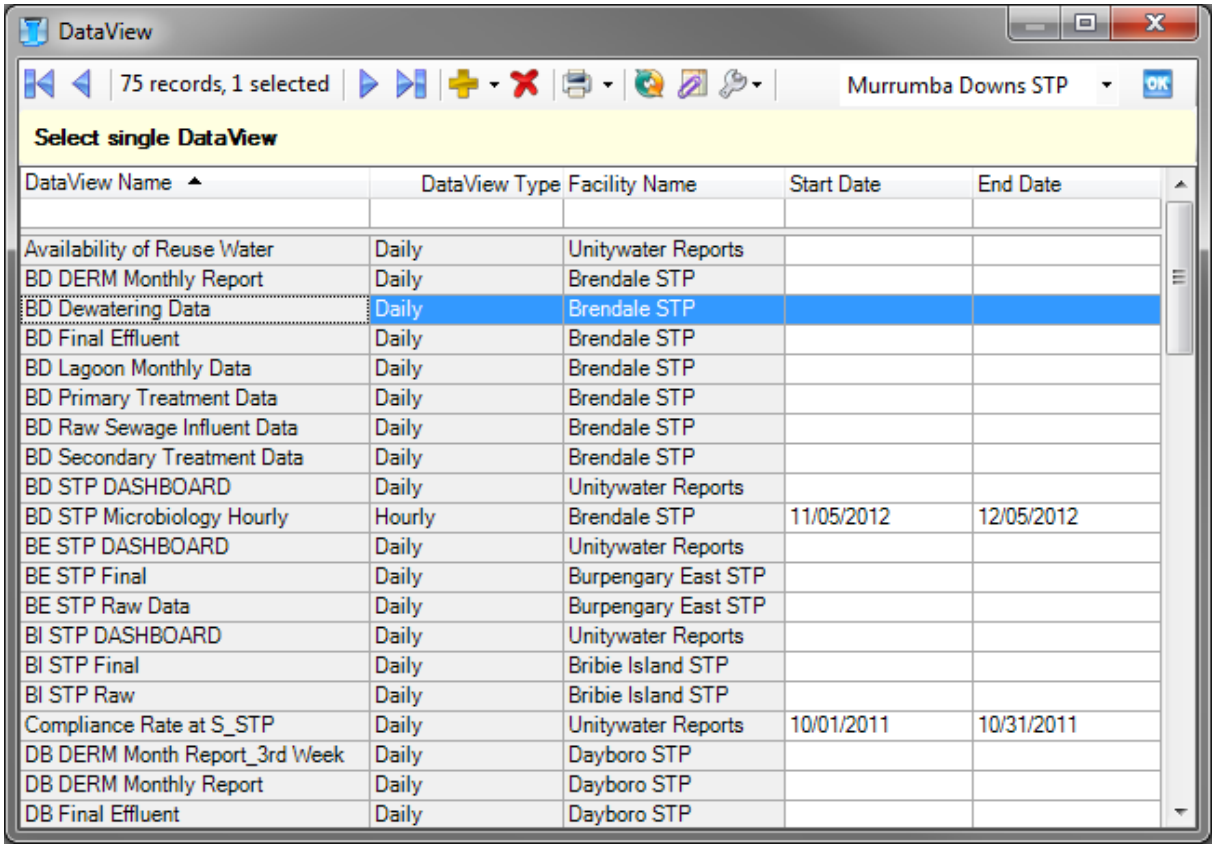
- DataView Application
- DataView Features
- eDV (Electronic DataView)

7.1 DataView List

The DataView List allows users to view, access and manage DataViews for the current database.



DataView Name	DataView Type	Facility Name	Start Date	End Date
Availability of Reuse Water	Daily	Unitywater Reports		
BD DERM Monthly Report	Daily	Brendale STP		
BD Dewatering Data	Daily	Brendale STP		
BD Final Effluent	Daily	Brendale STP		
BD Lagoon Monthly Data	Daily	Brendale STP		
BD Primary Treatment Data	Daily	Brendale STP		
BD Raw Sewage Influent Data	Daily	Brendale STP		
BD Secondary Treatment Data	Daily	Brendale STP		
BD STP DASHBOARD	Daily	Unitywater Reports		
BD STP Microbiology Hourly	Hourly	Brendale STP	11/05/2012	12/05/2012
BE STP DASHBOARD	Daily	Unitywater Reports		
BE STP Final	Daily	Burpengary East STP		
BE STP Raw Data	Daily	Burpengary East STP		
BI STP DASHBOARD	Daily	Unitywater Reports		
BI STP Final	Daily	Bribie Island STP		
BI STP Raw	Daily	Bribie Island STP		
Compliance Rate at S_STP	Daily	Unitywater Reports	10/01/2011	10/31/2011
DB DERM Month Report_3rd Week	Daily	Dayboro STP		
DB DERM Monthly Report	Daily	Dayboro STP		
DB Final Effluent	Daily	Dayboro STP		

NOTE: The DataView list has the general properties of the Grid and Grid Edit windows. (For more information about these sections, please see the topic: Grid Functionality).

DataView List Actions

From the DataView list, users can perform the following actions:

Create a New DataView

To create a new DataView, click the **[Add]** button or use the drop-down arrow to select from a list of available options. Creating a new DataView will open the DataView application and will present the DataView Properties window to the user.

Open a DataView

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To open a DataView, highlight the desired DataView and click the **[OK]** button. Users can also double-click the desired DataView to open the view.

Delete a DataView

To delete a DataView, highlight the desired DataView and click the **[Delete]** button. Confirm the deletion of the DataView by clicking either the **[Yes]** or **[No]** button.

7.2 Add DataView

There are many ways to create a new DataView:

Main Application

To create a new DataView from the Main Application, follow these steps:

1. Go to the View ribbon
2. Click the **[New DataView]** button
3. Choose from the available options:
   - Daily Values DataView
   - Hourly Values DataView
   - Summary Values DataView

DataView List

To create a new DataView from the Main Application, follow these steps:

1. Locate the **[Add]** button
2. Clicking directly on the **[Add]** button will take the user to the DataView Properties section
3. Clicking on the drop-down arrow beside the **[Add]** button will allow the user to choose from the following:
   - Daily Values DataView
   - Hourly Values DataView
   - Summary Values DataView

DataView Application

To create a new DataView from the DataView Application, follow these steps:

1. Go to the Home ribbon
2. Click the **[New DataView]** button
3. Choose from the available options:

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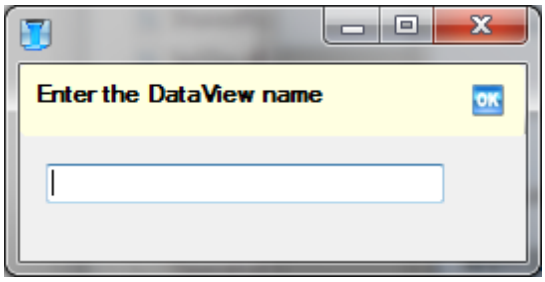
- Daily Values DataView
- Hourly Values DataView
- Summary Values DataView

7.3 DataView Name

DataView Name

DataViews are saved using a unique name. When saving a new DataView, users will be prompted to enter a DataView name. Users can also use the **Save As...** feature to save existing DataViews under a new name.



Save

In the **Home** ribbon, press the **[Save]** button and choose **Save DataView** to save the new DataView. Enter the DataView name into the dialog provided and click the **[OK]** button to save the DataView.

Save As

To save an existing DataView using a new name, find the **Home** ribbon, press the **[Save]** button and choose **Save As...** to save the new DataView. Enter the DataView name into the dialog provided and click the **[OK]** button to save the DataView with the new name.

7.4 Delete DataView

DataViews can be deleted as necessary. To delete a DataView, please follow these steps.

1. In the DataView List, highlight the DataView to be deleted.
2. Click the **[Delete]** button to delete.
3. Confirm the deletion of the DataView by clicking the **[Yes]** or **[No]** button.

NOTE: Deleting a DataView will not delete data, only the setup and settings of the selected DataView.

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WARNING: All information associated with the selected record(s) will be deleted upon confirmation of the deletion. This is permanent and cannot be undone.

7.5 DataView Data Entry

Data Entry

Data is conveniently entered directly into any grid cell by selecting the cell and then entering the value via the keyboard. Pressing the Enter or Tab key moves to the next cell.

Data is stored at a specific Location:Parameter, at a specific date or time. It may consist of Daily or Hourly values, Less Than, Greater Than, or Non-Detect values, Time or Date values, or Alpha Codes.

Data values are stored internally with 15 significant digit Precision. Internal values are unaffected by the number of display digits or following zeros. Numbers may range to ±1.0E16.

NOTE: Entered Data is automatically recognized by its format:
- Any entry containing a colon (:) is a Time value.
- Any entry containing a slash (/) is a Date value.
- Any entry beginning with a number, plus (+), or minus (-) is a Numeric value.
- Any entry beginning with a Less Than (<) is a Less Than value.
- Any entry beginning with a Greater Than (>) is a Greater Than value.
- Any entry beginning with a Tilde (~) is a Non-Detect value.
- Any entry beginning with an Alphabetic character (A, B, ...) is an Alpha Code.

7.6 DataView Columns

DataView Columns

Columns defined in the DataView represent Location:Parameters. Location:Parameters can be added to any DataView in order to provide customized display of important data.

Location:Parameters are added to DataViews as columns via the DataView Properties - Column Setup section. See the DataView Properties - Column Setup help topic for more information.

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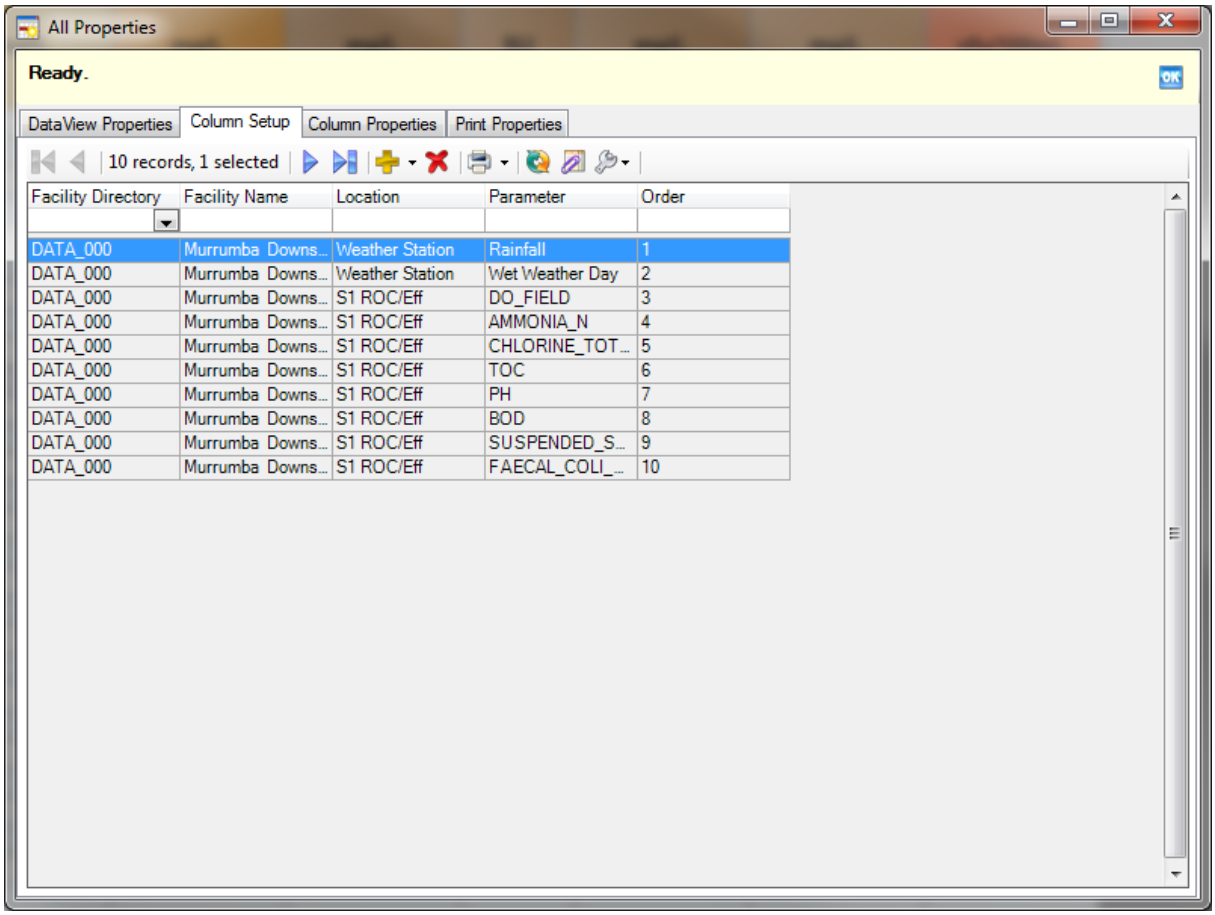
All Properties
Ready.
OK
DataView Properties
Column Setup
Column Properties
Print Properties
10 records, 1 selected
Facility Directory
Facility Name
Location
Parameter
Order
DATA_000 Murrumba Downs... Weather Station Rainfall 1
DATA_000 Murrumba Downs... Weather Station Wet Weather Day 2
DATA_000 Murrumba Downs... S1 ROC/Eff DO_FIELD 3
DATA_000 Murrumba Downs... S1 ROC/Eff AMMONIA_N 4
DATA_000 Murrumba Downs... S1 ROC/Eff CHLORINE_TOT... 5
DATA_000 Murrumba Downs... S1 ROC/Eff TOC 6
DATA_000 Murrumba Downs... S1 ROC/Eff PH 7
DATA_000 Murrumba Downs... S1 ROC/Eff BOD 8
DATA_000 Murrumba Downs... S1 ROC/Eff SUSPENDED_S... 9
DATA_000 Murrumba Downs... S1 ROC/Eff FAECAL_COLI_... 10

DataView Columns Setup

7.7 DataView Types

Topics included in this section:

- Daily Values DataView
- Hourly Values DataView
- Summary Values DataView

7.7.1 Daily Values DataView

Daily Values DataView

Daily Values DataView types allow users to display the DataView in a view that provides daily data in a row/column format. In this type of DataView, Location:Parameters are displayed as columns and days are displayed as rows.

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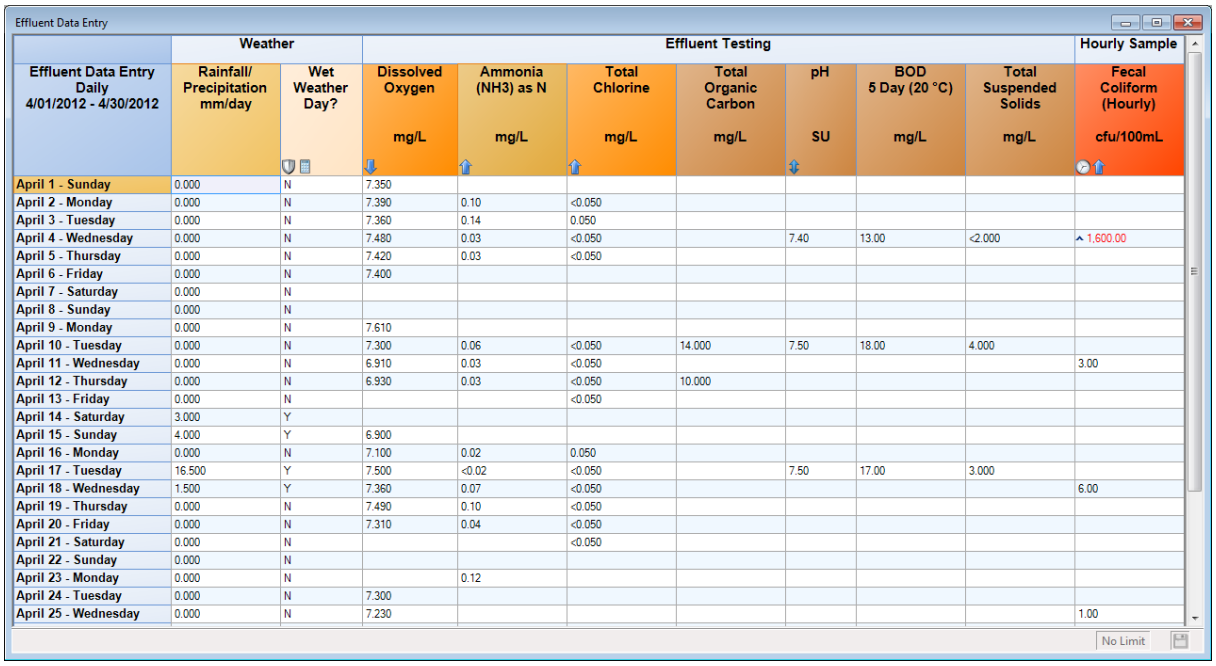
Effluent Data Entry

Effluent Data Entry Daily 4/01/2012 - 4/30/2012	Weather		Effluent Testing							Hourly Sample
	Rainfall/ Precipitation mm/day	Wet Weather Day?	Dissolved Oxygen mg/L	Ammonia (NH3) as N mg/L	Total Chlorine mg/L	Total Organic Carbon mg/L	pH SU	BOD 5 Day (20 °C) mg/L	Total Suspended Solids mg/L	Fecal Coliform (Hourly) cfu/100mL
April 1 - Sunday	0.000	N	7.350							
April 2 - Monday	0.000	N	7.390	0.10	<0.050					
April 3 - Tuesday	0.000	N	7.360	0.14	0.050					
April 4 - Wednesday	0.000	N	7.480	0.03	<0.050		7.40	13.00	<2.000	1,600.00
April 5 - Thursday	0.000	N	7.420	0.03	<0.050					
April 6 - Friday	0.000	N	7.400							
April 7 - Saturday	0.000	N								
April 8 - Sunday	0.000	N								
April 9 - Monday	0.000	N	7.610							
April 10 - Tuesday	0.000	N	7.300	0.06	<0.050	14.000	7.50	18.00	4.000	
April 11 - Wednesday	0.000	N	6.910	0.03	<0.050					3.00
April 12 - Thursday	0.000	N	6.930	0.03	<0.050	10.000				
April 13 - Friday	0.000	N			<0.050					
April 14 - Saturday	3.000	Y								
April 15 - Sunday	4.000	Y	6.900							
April 16 - Monday	0.000	N	7.100	0.02	0.050					
April 17 - Tuesday	16.500	Y	7.500	<0.02	<0.050		7.50	17.00	3.000	
April 18 - Wednesday	1.500	Y	7.360	0.07	<0.050					6.00
April 19 - Thursday	0.000	N	7.490	0.10	<0.050					
April 20 - Friday	0.000	N	7.310	0.04	<0.050					
April 21 - Saturday	0.000	N			<0.050					
April 22 - Sunday	0.000	N								
April 23 - Monday	0.000	N		0.12						
April 24 - Tuesday	0.000	N	7.300							
April 25 - Wednesday	0.000	N	7.230							1.00

No Limit

Daily Values DataView

Daily Values DataView Functionality

For additional information, the following functionality topics are available in the DataView section:

- Add New DataView
- DataView Properties - Display Options
- DataView Properties - Column Setup
- DataView Properties - Column Properties
- DataView Application

7.7.2 Hourly Values DataView

Hourly Values DataView

Hourly Values DataView types allow users to display the DataView in a view that provides daily data in a row/column format. In this type of DataView, Location:Parameters are displayed as columns and date/time intervals are displayed as rows.

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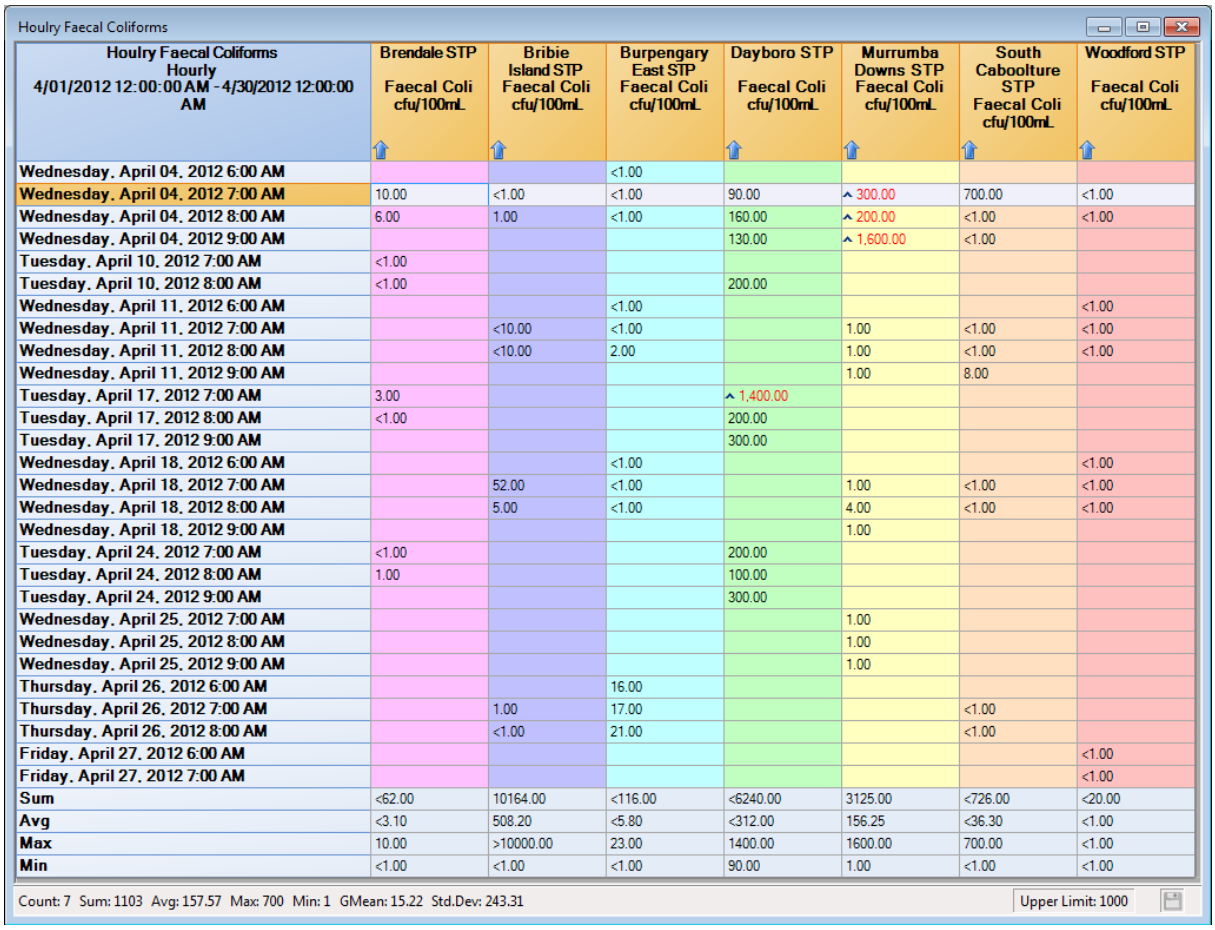

Houlry Faecal Coliforms

Houlry Faecal Coliforms Hourly 4/01/2012 12:00:00 AM - 4/30/2012 12:00:00 AM	Brendale STP Faecal Coli cfu/100mL	Bribie Island STP Faecal Coli cfu/100mL	Burpengary East STP Faecal Coli cfu/100mL	Dayboro STP Faecal Coli cfu/100mL	Murrumba Downs STP Faecal Coli cfu/100mL	South Caboolture STP Faecal Coli cfu/100mL	Woodford STP Faecal Coli cfu/100mL
Wednesday, April 04, 2012 6:00 AM			<1.00				
Wednesday, April 04, 2012 7:00 AM	10.00	<1.00	<1.00	90.00	^ 300.00	700.00	<1.00
Wednesday, April 04, 2012 8:00 AM	6.00	1.00	<1.00	160.00	^ 200.00	<1.00	<1.00
Wednesday, April 04, 2012 9:00 AM				130.00	^ 1,600.00	<1.00	
Tuesday, April 10, 2012 7:00 AM	<1.00						
Tuesday, April 10, 2012 8:00 AM	<1.00			200.00			
Wednesday, April 11, 2012 6:00 AM			<1.00				<1.00
Wednesday, April 11, 2012 7:00 AM		<10.00	<1.00		1.00	<1.00	<1.00
Wednesday, April 11, 2012 8:00 AM		<10.00	2.00		1.00	<1.00	<1.00
Wednesday, April 11, 2012 9:00 AM					1.00	8.00	
Tuesday, April 17, 2012 7:00 AM	3.00			^ 1,400.00			
Tuesday, April 17, 2012 8:00 AM	<1.00			200.00			
Tuesday, April 17, 2012 9:00 AM				300.00			
Wednesday, April 18, 2012 6:00 AM			<1.00				<1.00
Wednesday, April 18, 2012 7:00 AM		52.00	<1.00		1.00	<1.00	<1.00
Wednesday, April 18, 2012 8:00 AM		5.00	<1.00		4.00	<1.00	<1.00
Wednesday, April 18, 2012 9:00 AM					1.00		
Tuesday, April 24, 2012 7:00 AM	<1.00			200.00			
Tuesday, April 24, 2012 8:00 AM	1.00			100.00			
Tuesday, April 24, 2012 9:00 AM				300.00			
Wednesday, April 25, 2012 7:00 AM					1.00		
Wednesday, April 25, 2012 8:00 AM					1.00		
Wednesday, April 25, 2012 9:00 AM					1.00		
Thursday, April 26, 2012 6:00 AM			16.00				
Thursday, April 26, 2012 7:00 AM		1.00	17.00			<1.00	
Thursday, April 26, 2012 8:00 AM		<1.00	21.00			<1.00	
Friday, April 27, 2012 6:00 AM							<1.00
Friday, April 27, 2012 7:00 AM							<1.00
Sum	<62.00	10164.00	<116.00	<6240.00	3125.00	<726.00	<20.00
Avg	<3.10	508.20	<5.80	<312.00	156.25	<36.30	<1.00
Max	10.00	>10000.00	23.00	1400.00	1600.00	700.00	<1.00
Min	<1.00	<1.00	<1.00	90.00	1.00	<1.00	<1.00

Count: 7 Sum: 1103 Avg: 157.57 Max: 700 Min: 1 GMean: 15.22 Std.Dev: 243.31 Upper Limit: 1000

Hourly Values DataView

Daily Values DataView Functionality

For additional information, the following functionality topics are available in the DataView section:

- Add New DataView
- DataView Properties - Display Options
- DataView Properties - Column Setup
- DataView Properties - Column Properties
- DataView Application

7.7.3 Summary Values DataView

Summary Values DataView

Summary Values DataView types allow users to display the DataView in a view that provides daily data in a row/column format. In this type of DataView, Location:Parameters are displayed as columns and summarized monthly intervals are displayed as rows.

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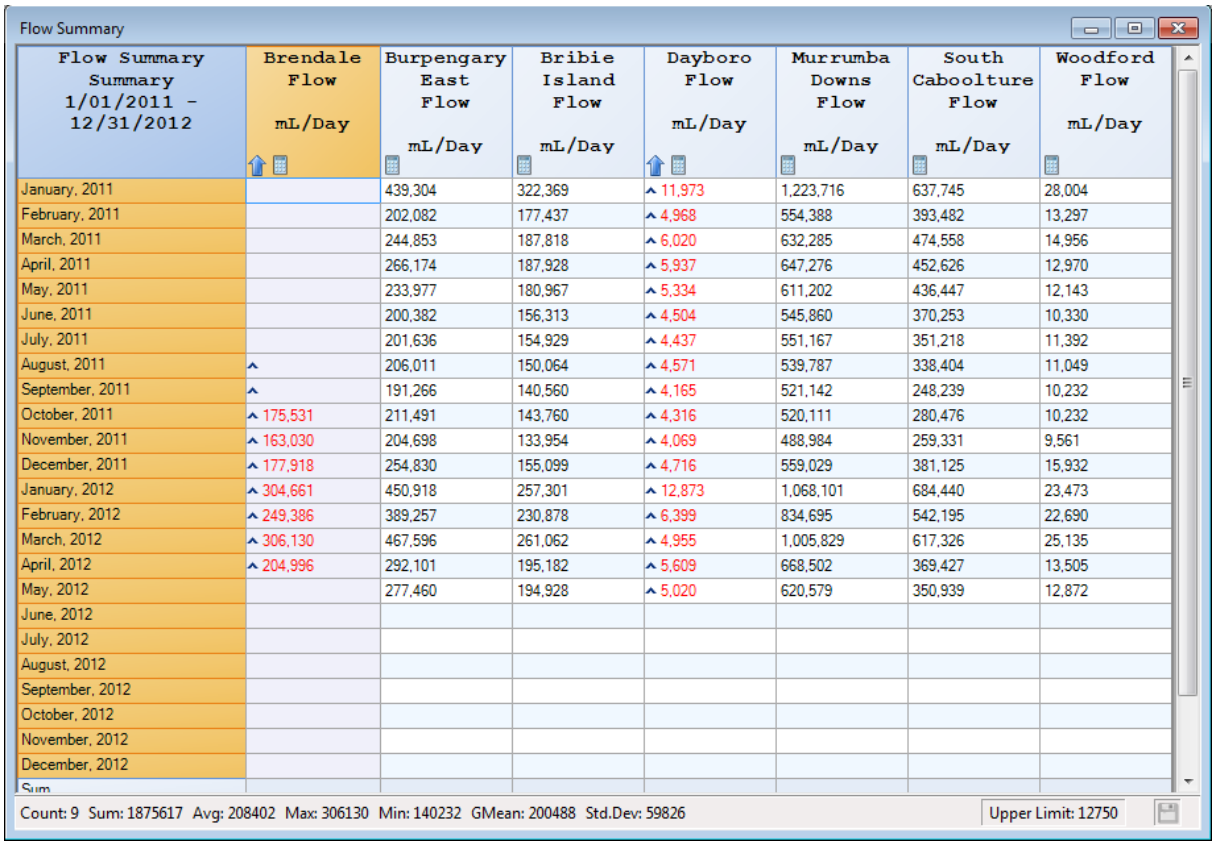

Flow Summary Summary 1/01/2011 - 12/31/2012	Brendale Flow mL/Day	Burpengary East Flow mL/Day	Bribie Island Flow mL/Day	Dayboro Flow mL/Day	Murrumba Downs Flow mL/Day	South Caboolture Flow mL/Day	Woodford Flow mL/Day
January, 2011		439,304	322,369	11,973	1,223,716	637,745	28,004
February, 2011		202,082	177,437	4,968	554,388	393,482	13,297
March, 2011		244,853	187,818	6,020	632,285	474,558	14,956
April, 2011		266,174	187,928	5,937	647,276	452,626	12,970
May, 2011		233,977	180,967	5,334	611,202	436,447	12,143
June, 2011		200,382	156,313	4,504	545,860	370,253	10,330
July, 2011		201,636	154,929	4,437	551,167	351,218	11,392
August, 2011		206,011	150,064	4,571	539,787	338,404	11,049
September, 2011		191,266	140,560	4,165	521,142	248,239	10,232
October, 2011	175,531	211,491	143,760	4,316	520,111	280,476	10,232
November, 2011	163,030	204,698	133,954	4,069	488,984	259,331	9,561
December, 2011	177,918	254,830	155,099	4,716	559,029	381,125	15,932
January, 2012	304,661	450,918	257,301	12,873	1,068,101	684,440	23,473
February, 2012	249,386	389,257	230,878	6,399	834,695	542,195	22,690
March, 2012	306,130	467,596	261,062	4,955	1,005,829	617,326	25,135
April, 2012	204,996	292,101	195,182	5,609	668,502	369,427	13,505
May, 2012		277,460	194,928	5,020	620,579	350,939	12,872
June, 2012							
July, 2012							
August, 2012							
September, 2012							
October, 2012							
November, 2012							
December, 2012							
Sum							

Summary Values DataView

Monthly intervals can be summarized as follows:

- Sum
- Average
- Maximum
- Minimum
- Count
- Geometric Mean
- Maximum 7-Day Average (1st of Month Rule)
- Minimum 7-Day Average (1st of Month Rule)
- Maximum 7-Day Average (Continuous Rule)
- Minimum 7-Day Average (Continuous Rule)
- User-Selected Formula

Daily Values DataView Functionality

For additional information, the following functionality topics are available in the DataView section:

- Add New DataView

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- DataView Properties - Display Options
- DataView Properties - Column Setup
- DataView Properties - Column Properties
- DataView Application

7.8 DataView Properties

Topics in this section include:

- DataView Properties - Display Properties
- DataView Properties - Column Setup
- DataView Properties - Column Properties
- DataView Properties - Print Properties

7.8.1 DataView Properties - Display

DataView Properties - Display

In the DataView Properties tab, users can customize display options for the DataView. Users can set the following options:

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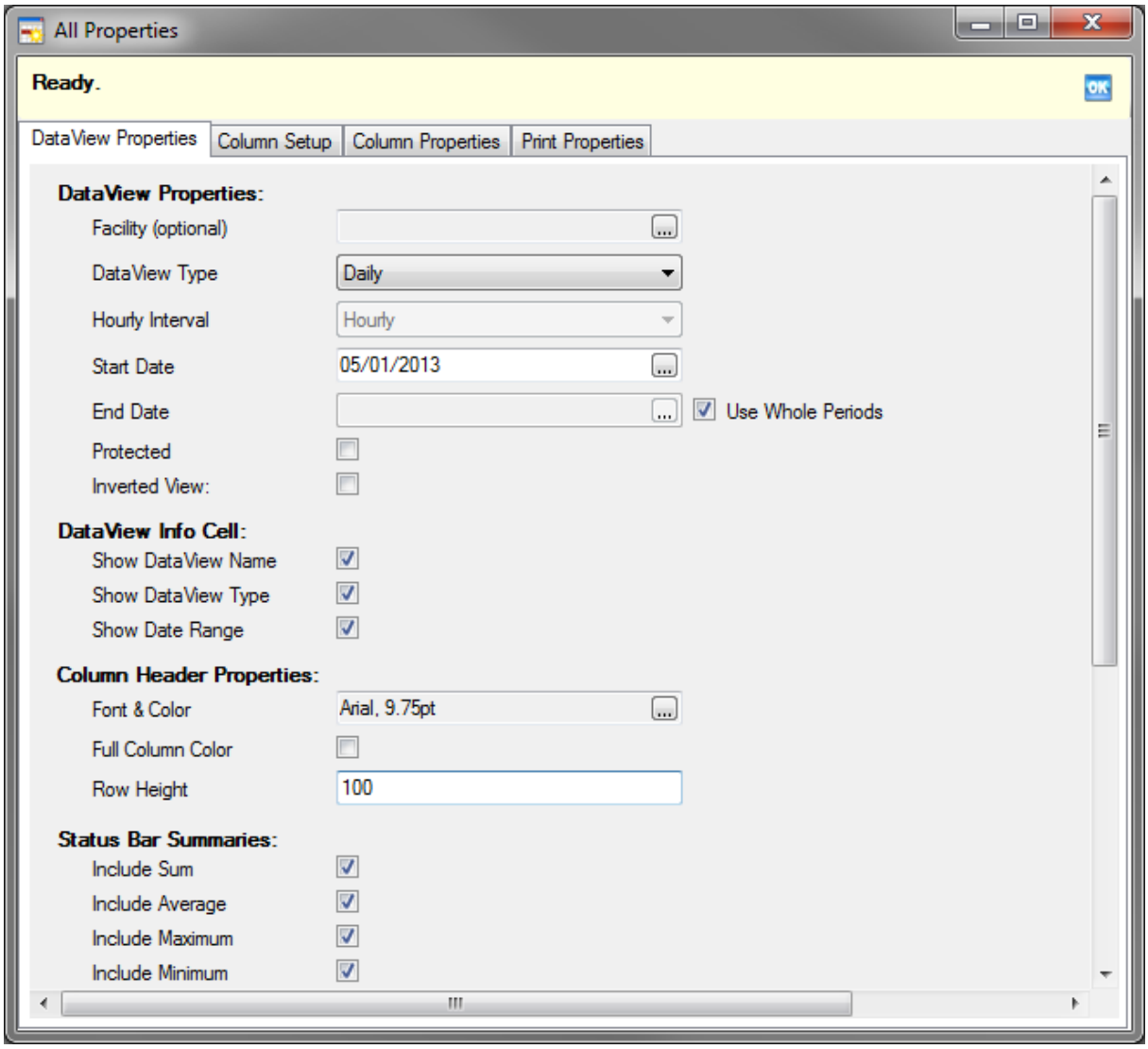

DataView Properties - Display Options

DataView Properties:

Facility (optional): Click the **[...]** button to select from a list of Facilities. The selection of a Facility in this field indicates to the DataView Application that user security should be applied based on the selected Facility.

> ***NOTE:*** The absence of a Facility in this field will allow the DataView to remain public. A DataView that does not have a Facility selected will be able to be edited by any user of the Operator10 program.

DataView Type: Choose from the available options in the drop-down menu to select the type of DataView.

Hourly Interval: Choose from the available options in the drop-down menu to select the hourly interval to be displayed.

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> ***NOTE:*** This field is only available when the Hourly DataView Type has been selected.

Start Date: Enter or select a date on which the DataView date range should begin.

End Date: Enter or select a date on which the DataView date range should end.

> ***NOTE:*** A blank Start and End Date will cause the DataView to open to the current period based on the type of DataView.

> ***NOTE:*** **Relative Dates** can be entered and saved for Start and End Date. See the Relative Dates help topic for more information.

Use Whole Periods: When checked, the option Use Whole Periods will enforce a strict view of data and limit the range to 1 day for Hourly Values DataViews, 1 month for Daily Values DataViews and 1 calender year period for Summary Values DataViews.

> ***NOTE:*** When checked, **Use Whole Periods** will disable the End Date field and will provide navigation arrows in the Home Ribbon of the DataView.

Protected: Place a check in the checkbox for **Protected** to force the DataView to be saved as a new DataView in the event of modifications.

Inverted View: Place a check in the checkbox for **Inverted View** to switch the display of Location:Parameters as rows rather than columns.

DataView Info Cell:

Show DataView Name: Place a check in the checkbox to display the DataView Name in the top-left corner cell of the DataView.

Show DataView Type: Place a check in the checkbox to display the DataView Type in the top-left corner cell of the DataView.

Show Date Range: Place a check in the checkbox to display the Date Range in the top-left corner cell of the DataView.

Column Header Properties:

Font & Color: Press the **[...]** button to select the Font properties for the Column Header row. Font, style, size, color, and effects can be selected.

Full Column Color: Place a check in the checkbox to display the selected column background color for the whole column.

Row Height: Enter a numeric value to define the height of the displayed column header row.

Status Bar Summaries:

Include (Sum/Average/Maximum/etc.): Place a check in the available checkboxes

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to display the selected summaries at the bottom of the DataView window. Summaries will be calculated in the status bar area based on the selected cells from the DataView.

Row Header Properties

Date Format: Select from the list of available choices in the Date Format drop-down menu to display date information. Entry of specific date formatting options is available, see the Date Format Options topic for more information.

Row Height: Enter a numeric value to define the height of the displayed data rows.

Font & Color: Press the **[...]** button to select the Font properties for the Row Headers. Font, style, size, color, and effects can be selected.

Data Display Properties:

Limits Color: Press the **[...]** button to select a color to be used in the display of data values that exceed the Location:Parameter data entry upper and lower limits.

Quick Note Color: Press the **[...]** button to select a color to be used in the display of the Quick Note indicator.

Font & Color: Press the **[...]** button to select the Font properties for the data. Font, style, size, color, and effects can be selected.

Row Striping: Place a check in the Row Striping checkbox to display alternating background colors for the data rows.

7.8.2 DataView Properties - Column Setup

DataView Properties - Column Setup

In the Column Setup tab, users can customize column setup for the DataView. Users can perform the following actions:

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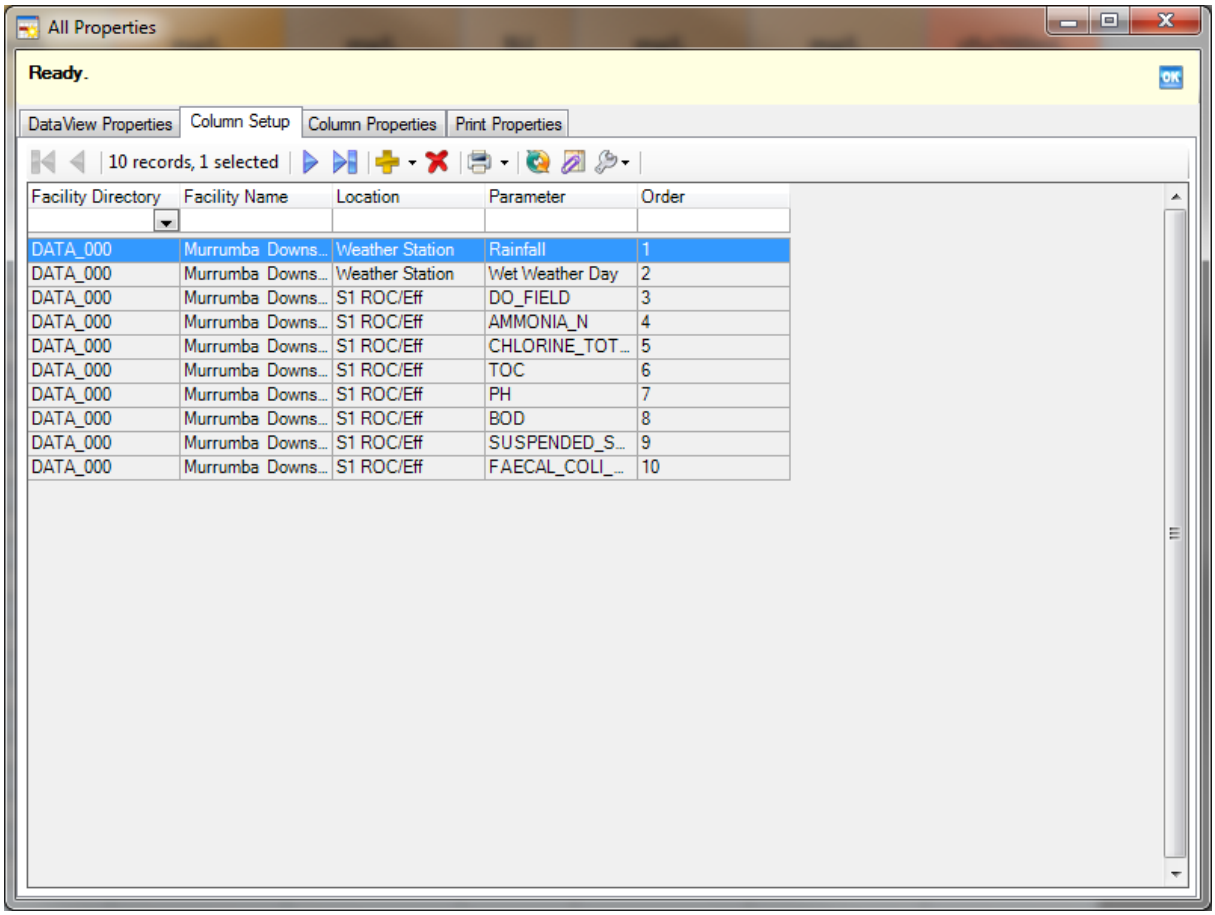
All Properties
Ready.
OK
DataView Properties
Column Setup
Column Properties
Print Properties
10 records, 1 selected
Facility Directory
Facility Name
Location
Parameter
Order
DATA_000 Murrumba Downs... Weather Station Rainfall 1
DATA_000 Murrumba Downs... Weather Station Wet Weather Day 2
DATA_000 Murrumba Downs... S1 ROC/Eff DO_FIELD 3
DATA_000 Murrumba Downs... S1 ROC/Eff AMMONIA_N 4
DATA_000 Murrumba Downs... S1 ROC/Eff CHLORINE_TOT... 5
DATA_000 Murrumba Downs... S1 ROC/Eff TOC 6
DATA_000 Murrumba Downs... S1 ROC/Eff PH 7
DATA_000 Murrumba Downs... S1 ROC/Eff BOD 8
DATA_000 Murrumba Downs... S1 ROC/Eff SUSPENDED_S... 9
DATA_000 Murrumba Downs... S1 ROC/Eff FAECAL_COLI_... 10

DataView Properties - Column Setup

Add Column

Click the **[Add]** button to display a list of Location:Parameters. Choose individual or multiple Location:Parameters to be added as columns in the DataView.

Multiple Facility Location:Parameters
Location:Parameters from multiple facilities can be selected. Use the Facility selection menu in the top-right area of the Location:Parameter list to select the **~ All ~** option. Choose from available Location:Parameters.

Insert Column Before

Click the drop-down menu beside the **[Add]** button and select the option **Insert Before** to insert a Location:Parameter before the selected Location:Parameter. Choose individual or multiple Location:Parameters from the provided picklist.

> ***NOTE:*** Right-click on a selected Location:Parameter in the grid area and select **Insert Column Before** from the right-click menu to perform the same action.

Insert Column After

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Click the drop-down menu beside the **[Add]** button and select the option **Insert After** to insert a Location:Parameter after the selected Location:Parameter. Choose individual or multiple Location:Parameters from the provided picklist.

> ***NOTE:*** Right-click on a selected Location:Parameter in the grid area and select **Insert Column After** from the right-click menu to perform the same action.

Delete Column

To delete a column, highlight single or multiple Location:Parameters from the displayed list of L:Ps and click the **[Delete]** button. Confirm the deletion of the selected Location:Parameters by answering **[Yes]** or **[No]** from the confirmation dialog.

Confirming Column Setup

Click the **[OK]** button to confirm the addition or removal of Location:Parameters as columns.

7.8.3 DataView Properties - Column Properties

DataView Properties - Column Properties

In the Column Properties tab, users can customize column display options for the DataView. Column Properties are set on the right-hand side of the Properties window. Properties can be set on a single selected Location:Parameter or for multiple selected Location:Parameters. Users can set properties the following items:

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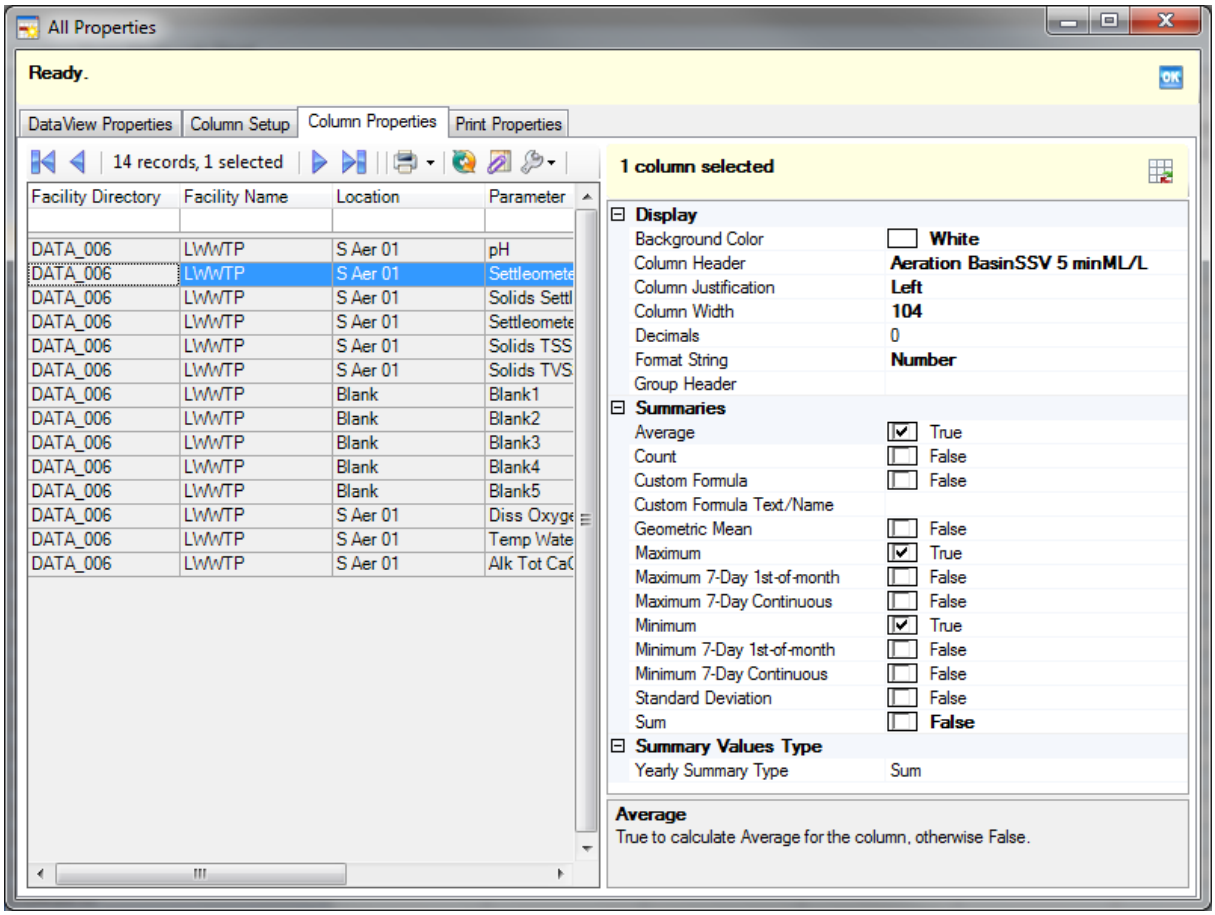

DataView Properties - Column Properties

Display

Options in the Display section section are as follows:

Background Color: Click the arrow in the cell for Backgroud Color to set the background color for the column header. If the option for Full Column Color is set, the selected column color will also be used for the full column.

Column Header: Use the column header field to enter/modify the header information for the selected Location:Parameter/column.

Column Justification: Select the desired justification (left, right. center or general) for the data displayed in the selected column(s).

Column Width: Enter a numeric value for the column width.

Decimals: Enter a numeric value for the decimal display of the selected column(s).

Format String: Select an option from the drop-down menu. Available options are:

- Currency - displays the local currency symbol
- Scientific Notation - displays the value in scientific notation format

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- General Number - displays the entered value to the last significant digit (0s are not displayed)
- Number - displays the entered value as a number with 0 following the last significant digit
- Percent - displays the % (percent) symbol
- Time - displays data as HH:MM (hour:minute) time values
- Date - displays data as Date values

Group Header: Enter text to be used as a group header or select from available group headers. For more information about Group Headers, see the Group Header help topic.

Summaries

Select from the list of available summaries to be displayed as column summaries at the bottom of the selected Location:Parameters.

Summary Values Types

If the selected DataView is the Summary Values Type, the selected option in the Summary Values Types section will determine the type of monthly summary displayed for the column(s).

Reset Columns

To reset column settings to the default presentation of DataView columns, click the **[Reset Column(s) to Default]** button. This will update all selected columns to their default display settings.

7.8.4 DataView Properties - Print Properties

Topics in this section include:

- DataView Print Properties - Options
- DataView Print Properties - Page
- DataView Print Properties - Margin
- DataView Print Properties - Header/Footer

7.8.4.1 DataView Print Properties - Options

DataView Print Properties - Options

In the DataView Print Properties - Options section, users can define options related to printing the selected DataView. Changes to the Print Options will affect the current, open DataView only and be saved independently from other DataViews.

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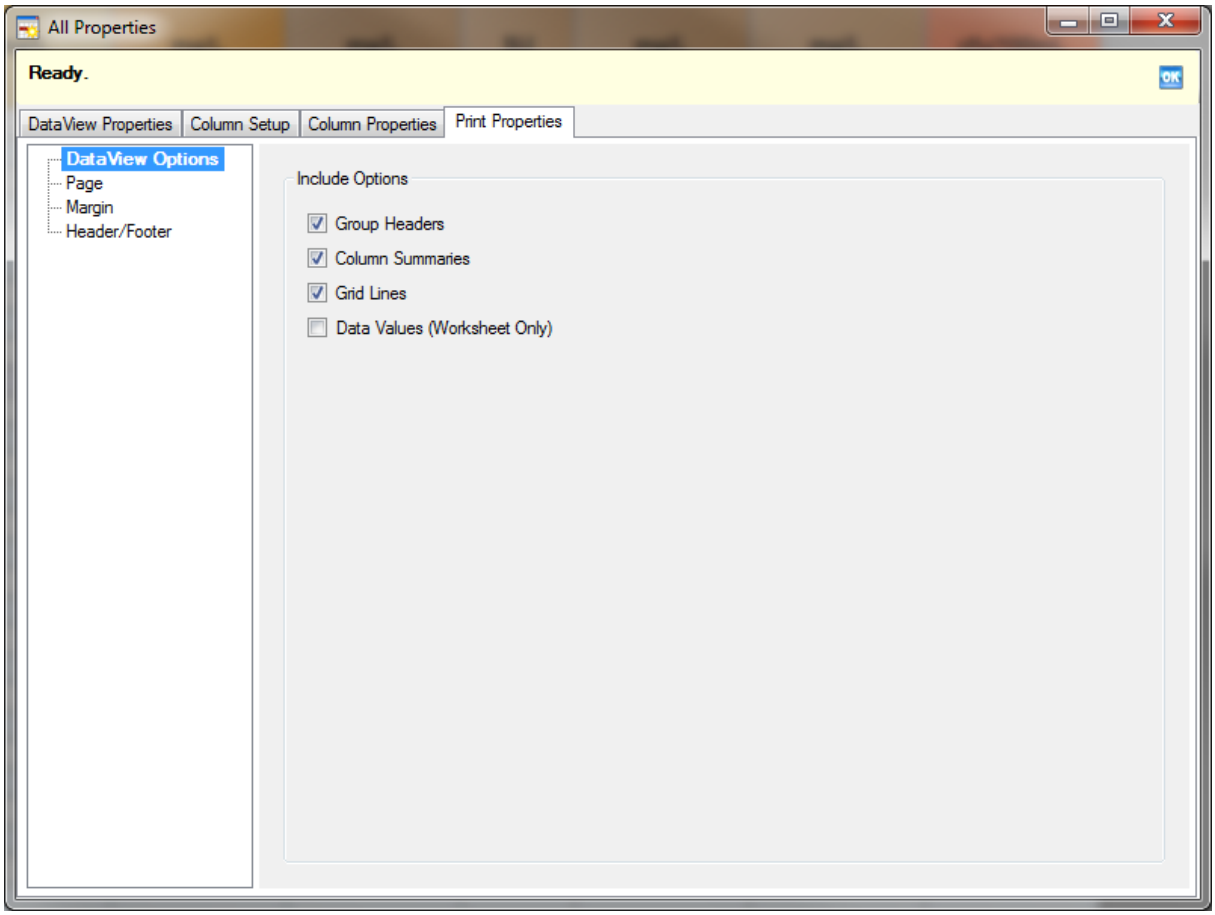

DataView Properties - Print Options

Options

The following Options are available:

Include - Group Headers: Check the checkbox for **Group Headers** to include Group Headers in the printed DataView.

Include - Column Summaries: Check the checkbox for **Column Summaries** to include the Column Summaries in the printed DataView.

Include - Grid Lines: Check the checkbox for **Grid Lines** to include grid lines (cell borders) in the printed DataView.

Include - Data Values (Worksheet): Check the checkbox for **Data Values (Worksheet)** to print the DataView without data, as a blank worksheet.

7.8.4.2 DataView Print Properties - Page

DataView Print Properties - Page

In the DataView Print Properties - Page section, users can define options related to printing the selected DataView. Changes to the Page options will affect the current, open

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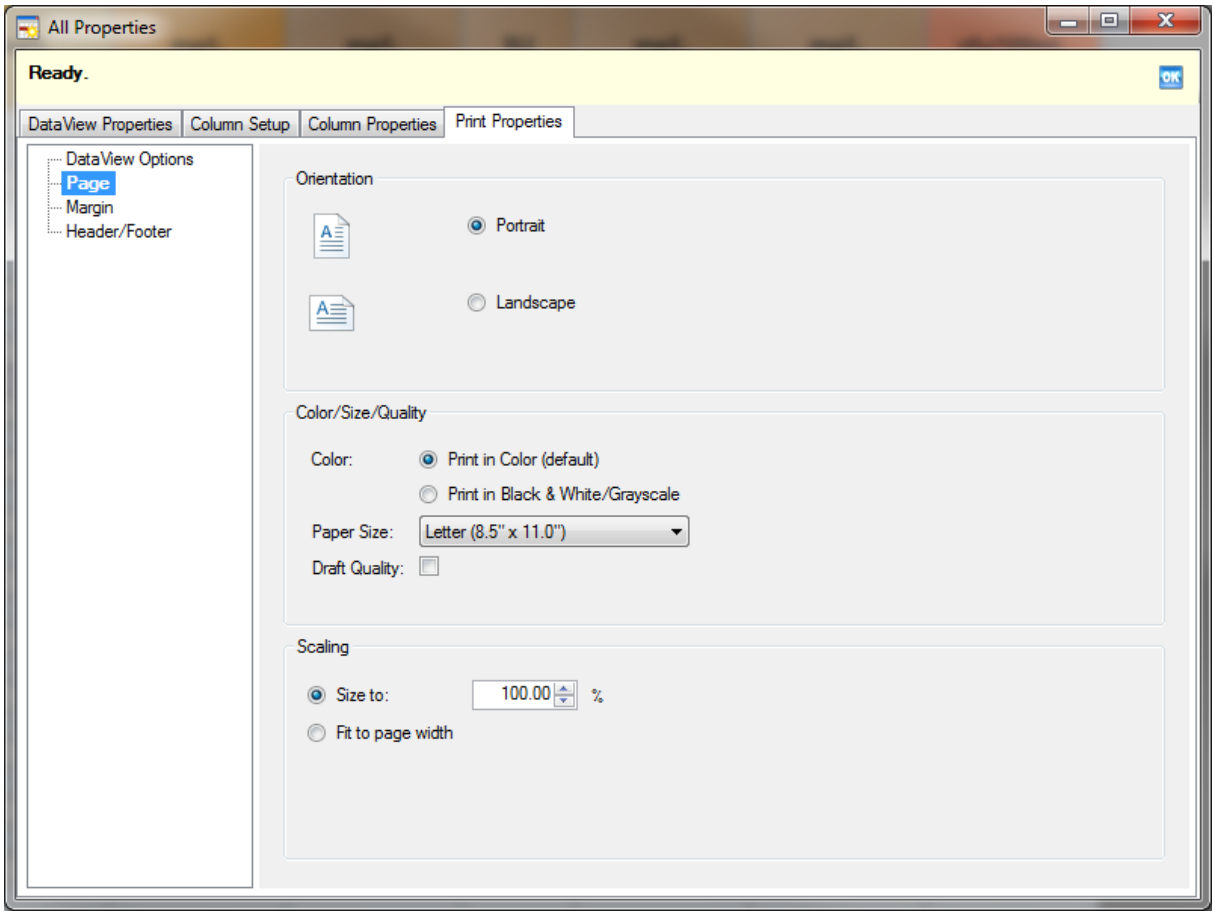
DataView only and be saved independently from other DataViews.



DataView Properties - Page

Page Options

The following Page options are available:

Orientation:

- **( ) Portrait -** Choose Portrait to print the DataView in a Portrait orientation.
- **( ) Landscape -** Choose Landscape to print the DataView in a Landscape orientation.

Color/Size/Quality:

- **Color -** Choose from the available options using the radio buttons to print in color or in black & white/grayscale.
- **Paper Size -** Choose from the available options in the drop-down menu to select a paper size.
- **Draft Quality -** Check the box for **Draft Quality** to print the DataView using the selected printer's draft quality setting. (Low quality print/shortest printing time)

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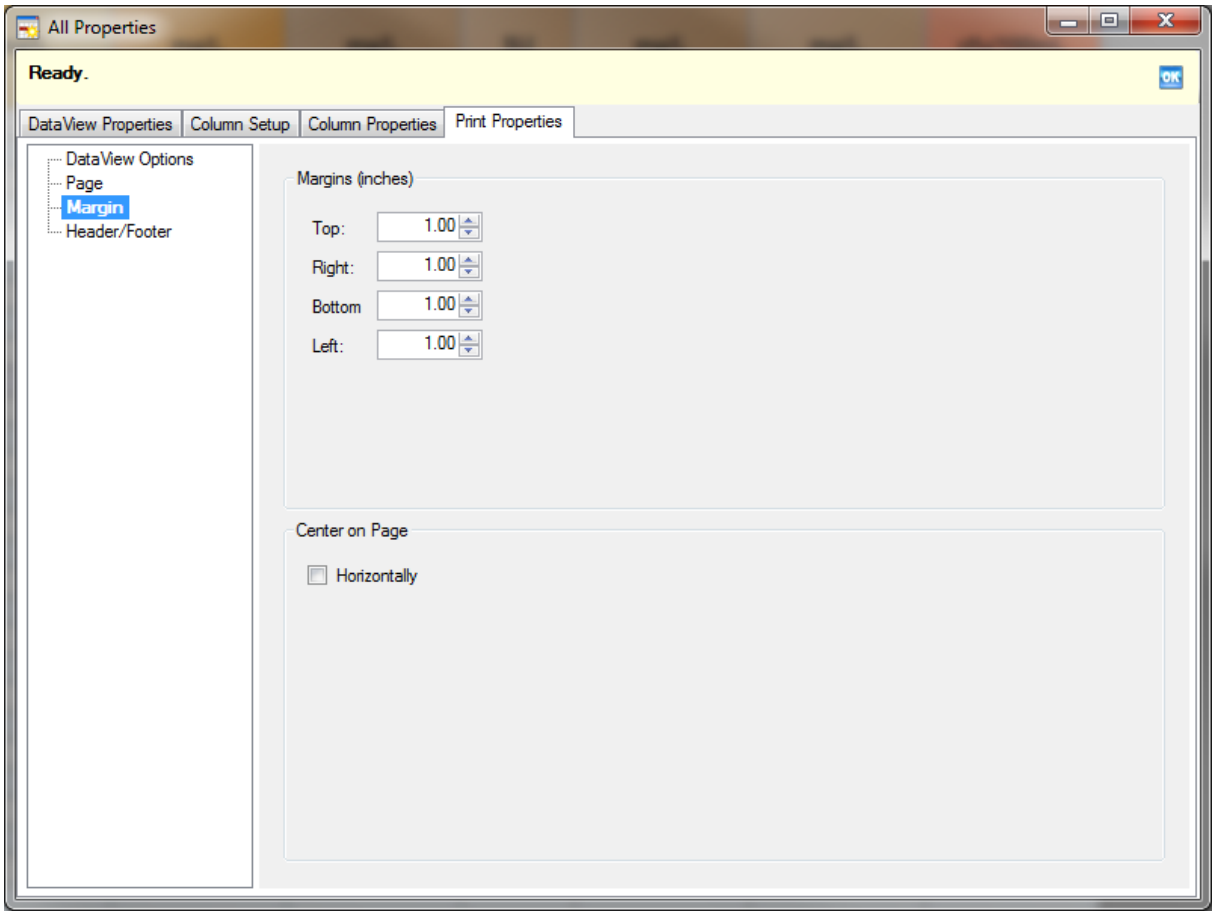
Scaling:

- **( ) Size to -** Select the option for **Size to** and enter a numeric value to define the size in percent that the DataView should be printed.
- **( ) Fit to page width -** Select the option for **Fit to page width** to force the page to be printed to the page width.

7.8.4.3 DataView Print Properties - Margin

DataView Print Properties - Margin

In the DataView Print Properties - Margin section, users can define options related to printing the selected DataView. Changes to the Margin options will affect the current, open DataView only and be saved independently from other DataViews.



DataView Properties - Margin

Margin Options

The following Margin options are available:

Margins: (inches)

- **Top:** Enter or set, using the up and down arrow controls, a numeric value in inches to define the **top** margin for the printed DataView

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- **Right:** Enter or set, using the up and down arrow controls, a numeric value in inches to define the **right** margin for the printed DataView
- **Bottom:** Enter or set, using the up and down arrow controls, a numeric value in inches to define the **bottom** margin for the printed DataView
- **Left:** Enter or set, using the up and down arrow controls, a numeric value in inches to define the **left** margin for the printed DataView

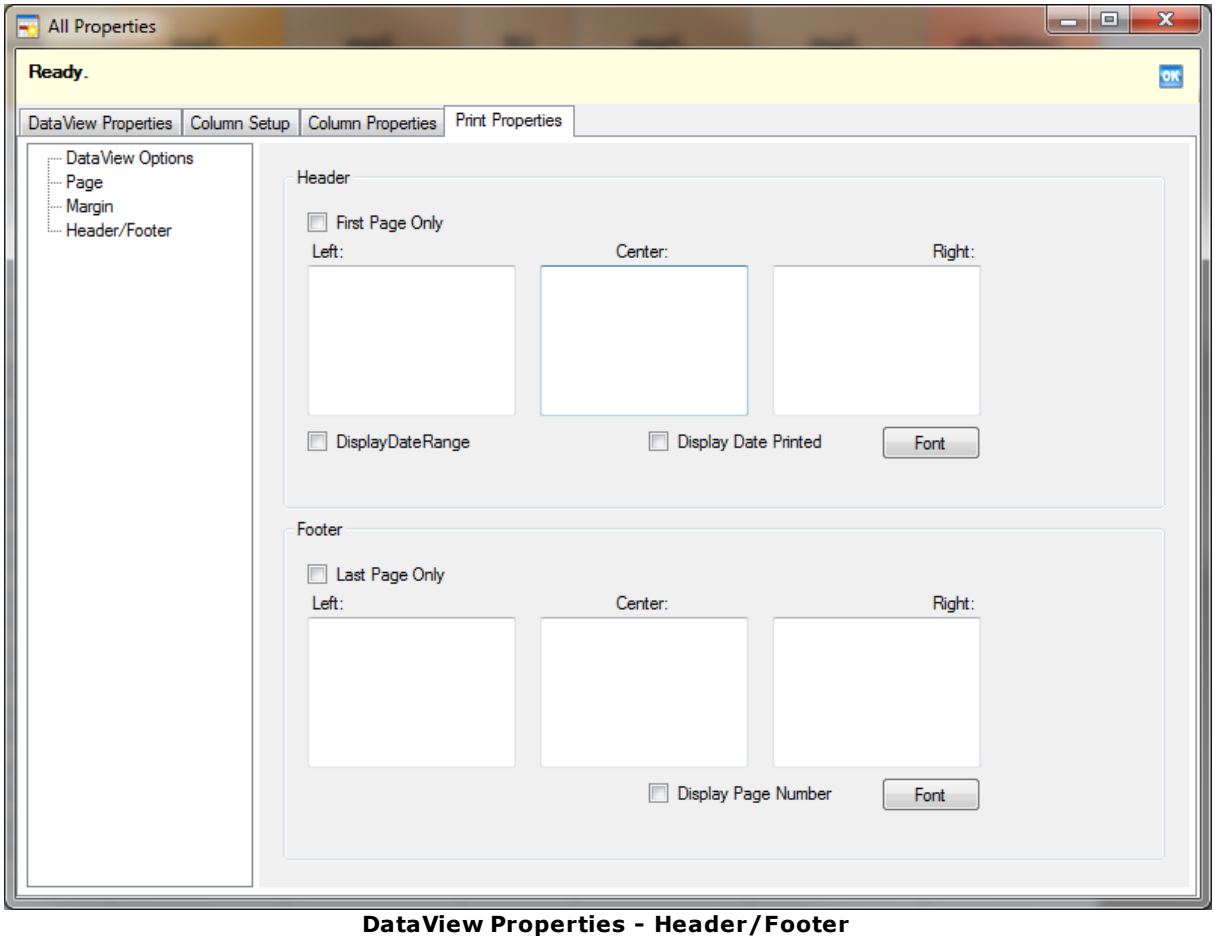
Center on Page:

- **Horizontally** - Check the checkbox to center the printed DataView on the page horizontally.

7.8.4.4 DataView Print Properties - Header/Footer

DataView Print Properties - Header/Footer

In the DataView Print Properties - Header/Footer section, users can define options related to printing the selected DataView. Changes to the Header/Footer options will affect the current, open DataView only and be saved independently from other DataViews.



DataView Properties - Header/Footer

Header/Footer Options

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The following Header/Footer options are available:

Header:

- **First Page Only** - Check the box for **First Page Only** to print the header information on the first printed page only.
- **Left** - Enter the desired text into the **Left** header field to define the Left header.
- **Center** - Enter the desired text into the **Center** header field to define the Center header.
- **Right** - Enter the desired text into the **Right** header field to define the Right header.

> ***NOTE:*** For the Left, Center and Right fields, a separate font can be defined. Right-click on each field and select **Font** from the right-click menu.

- **Display Date Range** - Check the box for **Display Date Range** to display the date range as defined by the DataView Properties in the header area of the printed DataView.
- **Display Date Printed** - Check the box for **Display Date Printed** to display the date when the DataView is printed.
- **Font** - Click the button for **Font** to set and save a desired font for the Date/ Header options if displayed on the printed DataView.

Footer:

- **Last Page Only** - Check the box for **Last Page Only** to print the footer information on the last printed page only.
- **Left** - Enter the desired text into the **Left** footer field to define the Left footer.
- **Center** - Enter the desired text into the **Center** footer field to define the Left footer.
- **Right** - Enter the desired text into the **Right** footer field to define the Left footer.

> ***NOTE:*** For the Left, Center and Right fields, a separate font can be defined. Right-click on each field and select **Font** from the right-click menu.

- **Display Page Number** - Check the box for **Display Page Number** to display the current page number on the printed DataView.
- **Font -** Click the button for **Font** to set and save a desired font for the Page/ Footer options if displayed on the printed DataView.

7.9 DataView Application

The DataView application presents data stored in the Operator10 - Wastewater database. Location:Parameter Data that has been entered, collected, calculated or otherwise stored in Operator10 - Wastewater is available for usage. DataViews use a row/ column format to provide standardized, easy-to-use tools for data entry and review. Many features and functionality is available in the DataView application.

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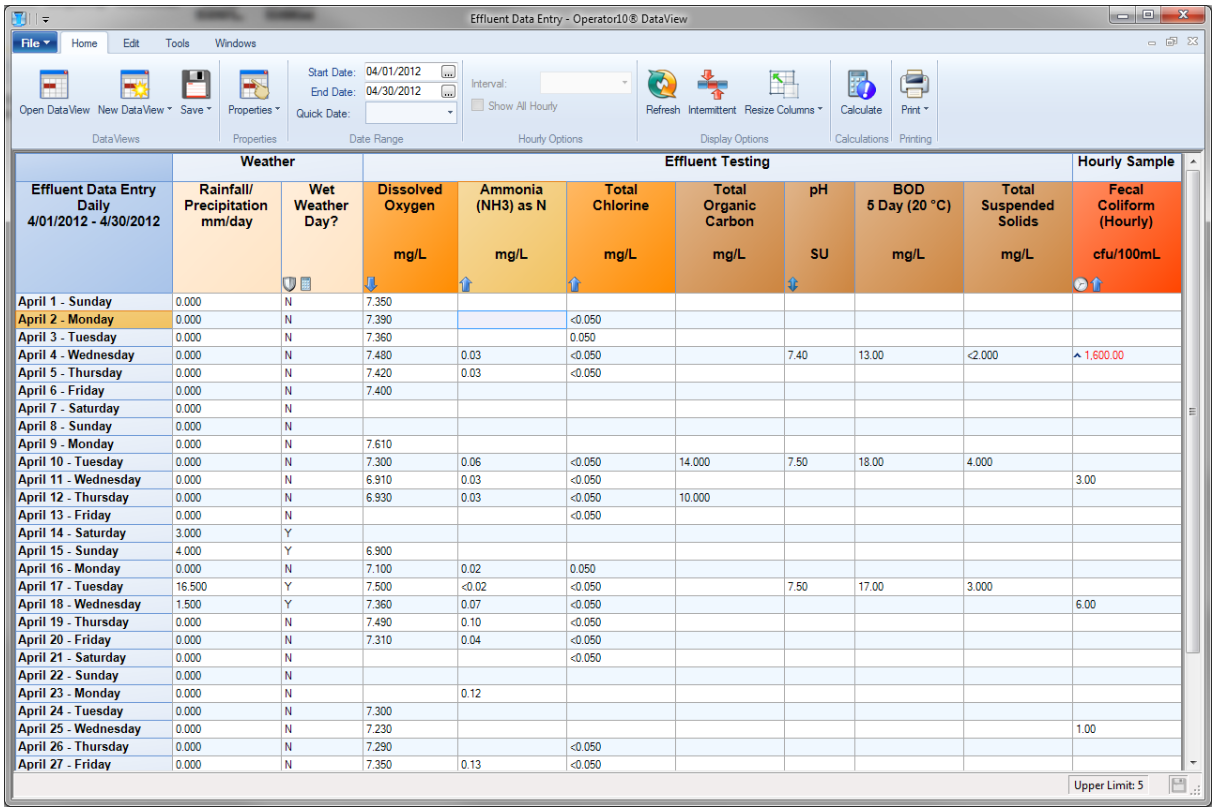

Effluent Data Entry Daily 4/01/2012 - 4/30/2012	Weather		Effluent Testing							Hourly Sample
	Rainfall/ Precipitation mm/day	Wet Weather Day?	Dissolved Oxygen mg/L	Ammonia (NH3) as N mg/L	Total Chlorine mg/L	Total Organic Carbon mg/L	pH SU	BOD 5 Day (20 °C) mg/L	Total Suspended Solids mg/L	Fecal Coliform (Hourly) cfu/100mL
April 1 - Sunday	0.000	N	7.350							
April 2 - Monday	0.000	N	7.390		<0.050					
April 3 - Tuesday	0.000	N	7.360		0.050					
April 4 - Wednesday	0.000	N	7.480	0.03	<0.050		7.40	13.00	<2.000	^ 1,600.00
April 5 - Thursday	0.000	N	7.420	0.03	<0.050					
April 6 - Friday	0.000	N	7.400							
April 7 - Saturday	0.000	N								
April 8 - Sunday	0.000	N								
April 9 - Monday	0.000	N	7.610							
April 10 - Tuesday	0.000	N	7.300	0.06	<0.050	14.000	7.50	18.00	4.000	
April 11 - Wednesday	0.000	N	6.910	0.03	<0.050					3.00
April 12 - Thursday	0.000	N	6.930	0.03	<0.050	10.000				
April 13 - Friday	0.000	N			<0.050					
April 14 - Saturday	3.000	Y								
April 15 - Sunday	4.000	Y	6.900							
April 16 - Monday	0.000	N	7.100	0.02	0.050					
April 17 - Tuesday	16.500	Y	7.500	<0.02	<0.050		7.50	17.00	3.000	
April 18 - Wednesday	1.500	Y	7.360	0.07	<0.050					6.00
April 19 - Thursday	0.000	N	7.490	0.10	<0.050					
April 20 - Friday	0.000	N	7.310	0.04	<0.050					
April 21 - Saturday	0.000	N			<0.050					
April 22 - Sunday	0.000	N								
April 23 - Monday	0.000	N		0.12						
April 24 - Tuesday	0.000	N	7.300							
April 25 - Wednesday	0.000	N	7.230							1.00
April 26 - Thursday	0.000	N	7.290		<0.050					
April 27 - Friday	0.000	N	7.350	0.13	<0.050					

The DataView application displays data and provides access to data entered and stored in the database.

DataView Application

The DataView application uses a ribbon menu system to display options and features. For more information, see the following topics related to the individual ribbons/menus:

- File
- Home
- Edit
- Tools
- Window

Additionally, the DataView Application makes use of the following features of the Main Application

- Quick Access Toolbar
- Windows Theme

7.9.1 DataView - File Menu

DataView - File Menu

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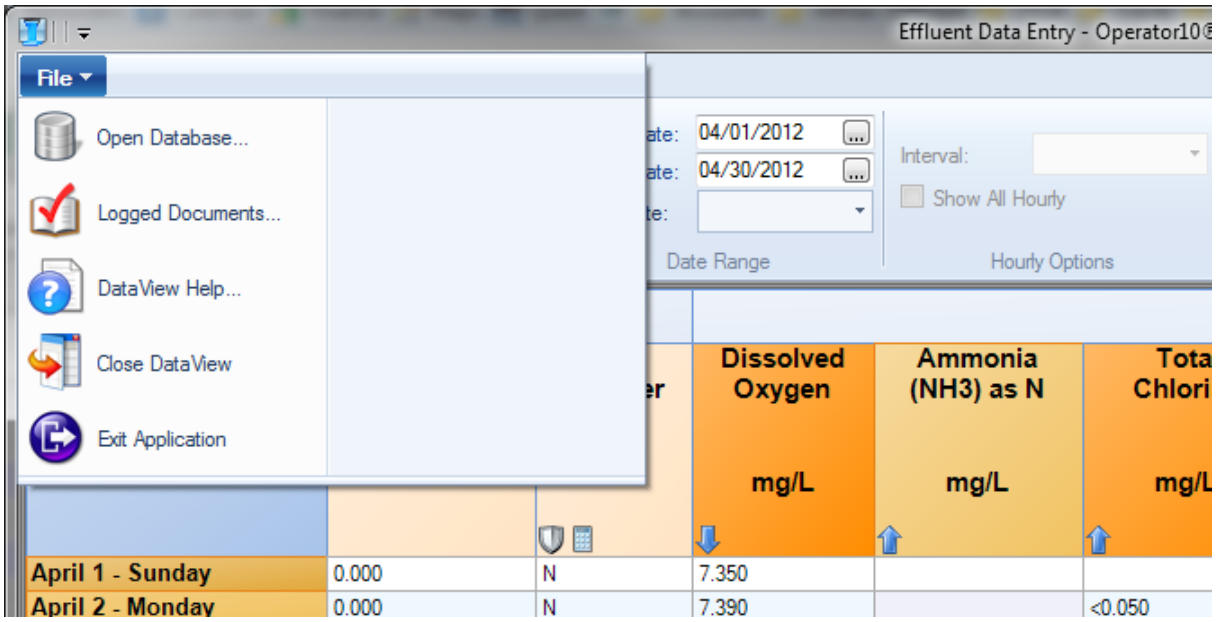


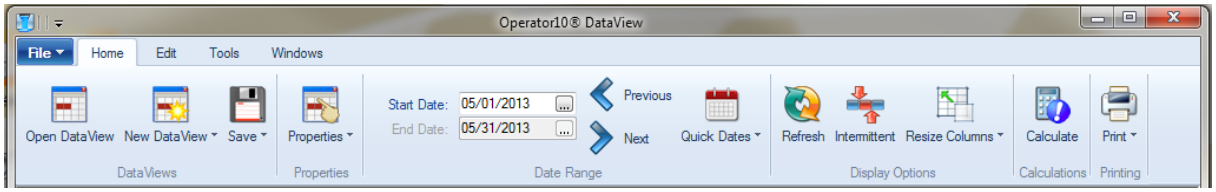
The DataView File Menu provide users with access to the following options:

- **Open Database...** - Provides the user with the ability to open a specific Database from the Open Database/Facility picklist
- **Logged Documents...** - Opens the Logged Documents list
- **DataView Help...** - Opens the DataView Help File
- **Close DataView** - Closes the current DataView
- **Exit Application** - Exits the DataView application

7.9.2 DataView - Home Ribbon

DataView - Home Ribbon

The DateView Home ribbon provides important access to key features and primary functionality of the DataView application.



The DataView Home ribbon provides important access to key features and primary functionality.

Home Ribbon functions

The following options are available in the Home ribbon (and are discussed as they appear in the button groups):

DataViews:

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- **Open DataView** - Press the **[Open DataView]** button to display the DataView List
- **New DataView** - Press the **[New DataView]** button to select from a list of new DataView Types to create a new DataView
- **Save** - Press the **[Save]** button to choose Save or Save As...

> ***NOTE:*** The **Save As...** option exists as a secondary option and allows the user to save the DataView using a different name.

Properties:

- **Properties** - Press the **[DataView Properties]** to select from a list of DataView Properties sections

Date Range:

- **Start Date** - Enter or choose a start date (use the **[...]** button to display a Calendar) for the DataView
- **End Date** - Enter or choose an end date (use the **[...]** button to display a Calendar) for the DataView

> ***NOTE:*** **Relative Dates** can be entered and saved for Start and End Date. See the Relative Dates help topic for more information.

- **Previous & Next** - When visible, press the **[Previous]** or **[Next]** buttons to move to the next whole period in the DataView.

> ***NOTE:*** The DataView Properties option **Use Whole Periods** must be turned on to display and use the previous and next buttons. Use Whole Periods enables the user to navigate from defined period to defined period consecutively.
>
> - For Hourly DVs, the period is 1 day
> - For Daily DVs, the period is 1 month
> - For Summary DVs, the period is 1 calendar year (beginning in January)
>
> To enable, see the DataView Properties help topic

- **Quick Date** - Press the button to choose from the available options to set a Start and End Date for the current DataView

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NOTE: Depending on the type of DataView in use, the Quick Date options will be adjusted to provide options relative the the type.

Hourly Options:

- **Interval** - When the DataView type is Hourly, choose from the available Hourly Interval options to display data entered on the selected interval
- **Show All Hourly** When the DataView type is Hourly, check the **Show All Hourly** option to show all Hourly data entered, regardless of the selected Interval

Display Options:

- **Refresh** - Press the **[Refresh]** button to refresh or re-query the DataView from the Database
- **Intermittent** - Press the **[Intermittent]** button to change the DataView to show only data entered for the date range, excluding any blank cells from display
- **Resize Columns** - Press the **[Resize Columns]** button to select from the available options to resize all columns or resize selected columns only

Calculations:

- **Calculate** - Press the **[Calculate Now]** button to bring up the Calculate Utility

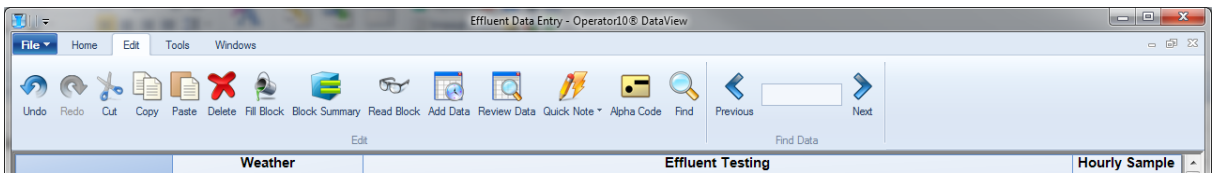
Printing:

- **Print** - Press the **[Print]** button to select from the available options of Print Preview or Print.

7.9.3 DataView - Edit Ribbon

DataView - Edit Ribbon

The DateView Edit ribbon provides access to functionality to edit data displayed in the DataView cells.



The DataView Edit ribbon provides access to functionality related to data entry.

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Edit Ribbon functions

The following options are available in the Edit ribbon (and are discussed as they appear in the button groups):

Edit:

- **Undo** - Press the **[Undo]** button to undo recent data entries
- **Redo** - Press the **[Redo]** button to redo recent data entries
- **Cut** - Press the **[Cut]** button to cut data from the selected data cells into memory/clipboard
- **Copy** - Press the **[Copy]** button to copy data from the selected cells into memory/clipboard
- **Paste** - Press the **[Paste]** button to paste data into the selected cells from memory/clipboard
- **Delete** - Press the **[Delete]** button to delete data from the selected cells
- **Fill Block** - Press the **[Fill Block]** button to fill the selection of cells with data from the first selected cell in a column; multiple columns will be filled with values from the first selected (top) cell in each column individually
- **Block Summary** - Press the **[Block Summary]** button to open a pop-up of dialog window displaying summarized results based on the selected cells; common functions such as Sum, Average, Maximum, Minimum and more will be displayed based on the selected cells
- **Read Block** - Press the **[Read Block]** button to have selected values read back to the user from the computer
- **Add Data** - Press the **[Add Data]** button to perform data entry using the Add Data dialog for the selected Location:Parameter
- **Review Data** - Press the **[Review Data]** button to Review Data in the database for the selected Location:Parameter
- **Quick Note** - Press the **[Quick Note]** button to select from the available options of View/Edit Quick Note or Print Quick Notes for the selected cells
- **Alpha Code** - Press the **[Alpha Code]** button to view a list of Alpha Codes available for entry into the selected cell

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- **Find** - Press the **[Find]** button to find data entered in the DataView

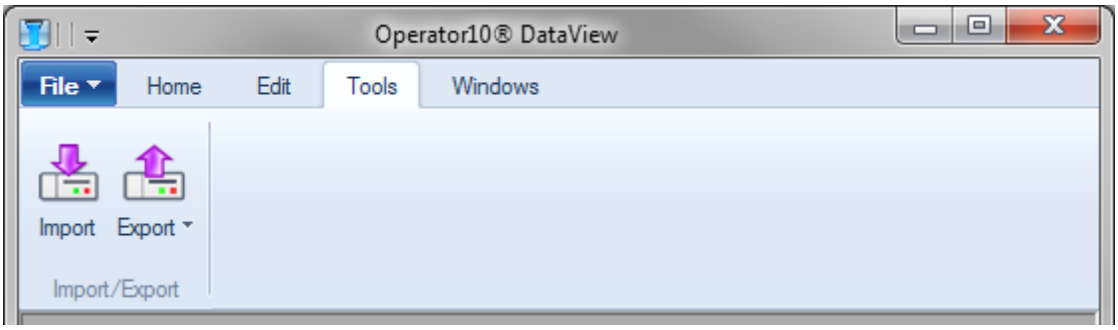
Find Data:

- **Previous** - Use the **[(Find) Previous]** button to find and highlight the previous matching data value entered in the DataView based on the [Find Data Field] entry
- **[Find Data Field]** - Enter a value in the Find field to find data displayed in the open DataView
- **Next** - Use the **[(Find) Next]** button to find and highlight the next matching data value entered in the DataView based on the [Find Data Field] entry

7.9.4 DataView - Tools Ribbon

DataView - Tools Ribbon

The DateView Tools ribbon provides access to functionality to import and export data displayed in the DataView cells.



The DataView Tools ribbon provides access to functionality related to the import and export of data.

Tools Ribbon functions

The following options are available in the Tools ribbon (and are discussed as they appear in the button groups):

Import/Export:

- **Import** - Press the **[Import]** button to begin the Import data process
- **Export** - Press the **[Export]** button to choose from a list of available Export file options

NOTE: See the linked help topics for Import and Export for more information about the Import and Export processes.

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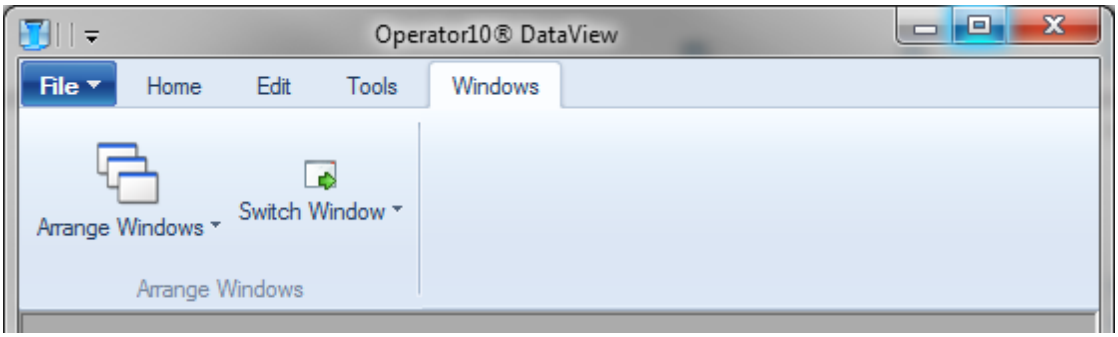
7.9.5 DataView - Window Ribbon

DataView - Window Ribbon

The DateView Window ribbon provides access to functionality to DataView application window behaviors.



The DataView Window ribbon provides access to functionality related to the behaviors of the DataView windows.

Window Ribbon functions

The following options are available in the Window ribbon (and are discussed as they appear in the button groups):

Arrange Windows:

- **Arrange Windows** - Press the **[Arrange Windows]** button and select from the drop-down menu:
  - **Cascade** - arrange all open DataView Windows in normal overlapping windows, with the current DataView window in front
  - **Tile Horizontally** - arrange all open DataView Windows in tiled windows, with the current DataView window at the top left
  - **Tile Vertically** - arrange all open DataView Windows in tiled windows, with the current DataView window at the top left
  - **Arrange Icons** - arrange any iconized/minimized windows along the lower left of the DataView application window.
  - **Minimize All** - minimize all open DataView windows
  - **Restore All** - restore all minimized DataView windows
- **Switch Window** - Press the **[Switch Window]** button to select from a list of open DataView windows to switch to

7.9.6 Keyboard Shortcuts

Keyboard Shortcuts

The following list is a listing of available keyboard shortcuts found in the DataView section.

- **Ctrl+A** - Select All Data Cells

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- **Ctrl+C** - Copy
- **Ctrl+E** - Block Read
- **Ctrl+F** - Toggle Full-Column Color
- **Ctrl+H** - AddData Editor
- **Ctrl+J** - Column Properties
- **Ctrl+L** - Alpha Code Picklist
- **Ctrl+M** - Block Summary
- **Ctrl+N** - Edit Quick Note
- **Ctrl+P** - Print To Printer
- **Ctrl+Shift+P** - Print To Preview
- **Ctrl+R** - Toggle Row Striping
- **Ctrl+S** - Save DataView
- **Ctrl+V** - Paste
- **Ctrl+W** - Review Data
- **Ctrl+X** - Cut
- **Ctrl+Y** - Redo Data
- **Ctrl+Z** - Undo Data
- **Ctrl+Space** - Displays calculator
- **Ctrl+Home** - Move Selection to Top-Left Cell
- **Ctrl+End** - Move Selection to Bottom-Right Cell
- **Space** - Edit Current Cell
- **Delete** - Delete
- **Enter** - Move Down 1 Cell
- **F3** - Find Next
- **Shift+F3** - Call FindValue Dialog
- **F5** - Refresh DataView
- **F12** - Save DataView As
- **Tab** - Move across to next cell
- **Shift+Tab** - Move across to previous cell

7.10 DataView Features

Topics in this section include:

- Group Headers
- Column Headers
- DataView Column Icons
- Find Data
- Quick Notes
- Import Data
- Export Data
- Freeze Columns

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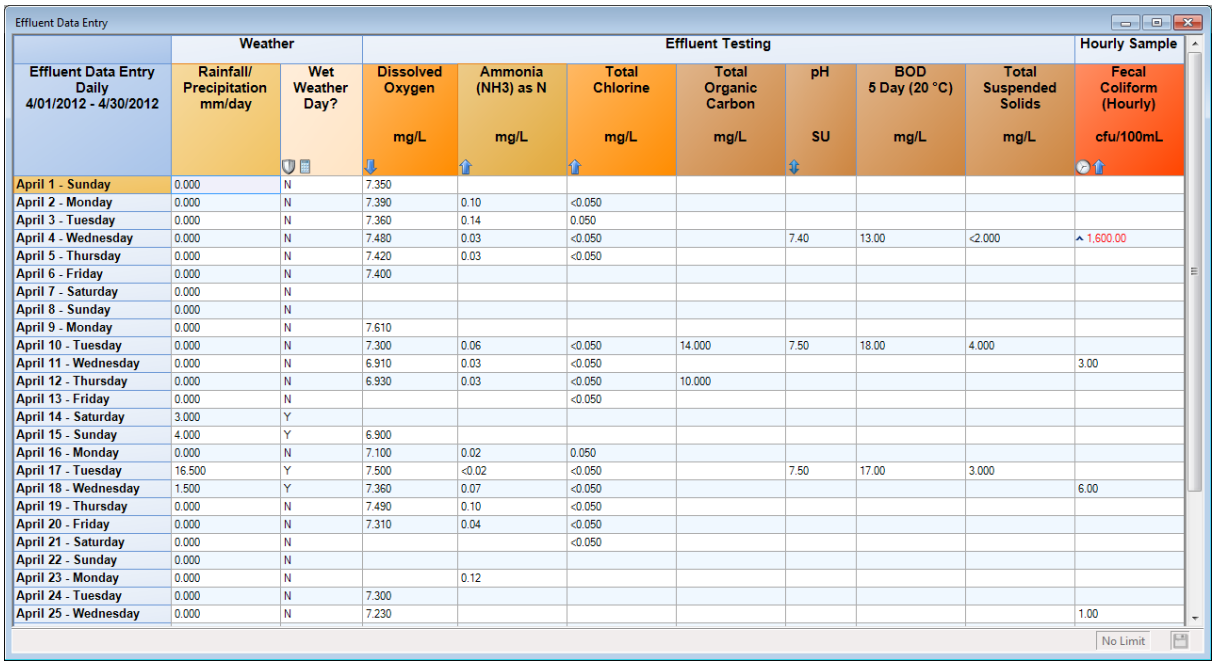
- Right-Click Functionality
- Block Summary

7.10.1 Group Headers

Group Headers

Group Headers can be defined for selected columns and based on proximity to identical group headers, will provide the user with an additional header row in a DataView. The entered Group Header will appear, centered, for the grouped columns.

Group Header information can be entered in the DataView Properties - Column Properties section under the Display options.



	Weather		Effluent Testing							Hourly Sample
Effluent Data Entry Daily 4/01/2012 - 4/30/2012	Rainfall/ Precipitation mm/day	Wet Weather Day?	Dissolved Oxygen mg/L	Ammonia (NH3) as N mg/L	Total Chlorine mg/L	Total Organic Carbon mg/L	pH SU	BOD 5 Day (20 °C) mg/L	Total Suspended Solids mg/L	Fecal Coliform (Hourly) cfu/100mL
April 1 - Sunday	0.000	N	7.350							
April 2 - Monday	0.000	N	7.390	0.10	<0.050					
April 3 - Tuesday	0.000	N	7.360	0.14	0.050					
April 4 - Wednesday	0.000	N	7.480	0.03	<0.050		7.40	13.00	<2.000	^ 1,600.00
April 5 - Thursday	0.000	N	7.420	0.03	<0.050					
April 6 - Friday	0.000	N	7.400							
April 7 - Saturday	0.000	N								
April 8 - Sunday	0.000	N								
April 9 - Monday	0.000	N	7.610							
April 10 - Tuesday	0.000	N	7.300	0.06	<0.050	14.000	7.50	18.00	4.000	
April 11 - Wednesday	0.000	N	6.910	0.03	<0.050					3.00
April 12 - Thursday	0.000	N	6.930	0.03	<0.050	10.000				
April 13 - Friday	0.000	N			<0.050					
April 14 - Saturday	3.000	Y								
April 15 - Sunday	4.000	Y	6.900							
April 16 - Monday	0.000	N	7.100	0.02	0.050					
April 17 - Tuesday	16.500	Y	7.500	<0.02	<0.050		7.50	17.00	3.000	
April 18 - Wednesday	1.500	Y	7.360	0.07	<0.050					6.00
April 19 - Thursday	0.000	N	7.490	0.10	<0.050					
April 20 - Friday	0.000	N	7.310	0.04	<0.050					
April 21 - Saturday	0.000	N			<0.050					
April 22 - Sunday	0.000	N								
April 23 - Monday	0.000	N		0.12						
April 24 - Tuesday	0.000	N	7.300							
April 25 - Wednesday	0.000	N	7.230							1.00

The DataView displayed here has been setup to display Group Headers. See the top row displayed above the normal column header.

Columns with defined Group Headers, when placed immediately next to one another, will automatically display the group header information.

> ***NOTE:*** For DataViews without Group Headers defined for any selected Location:Parameter/Column, the group header row will not be displayed.

7.10.2 Column Headers

Column Headers

Column Headers can be defined for any column displayed in a DataView. Column headers are customized in a way that allows users to identify the Facility:Location:Parameter using a common, or understood, naming convention.

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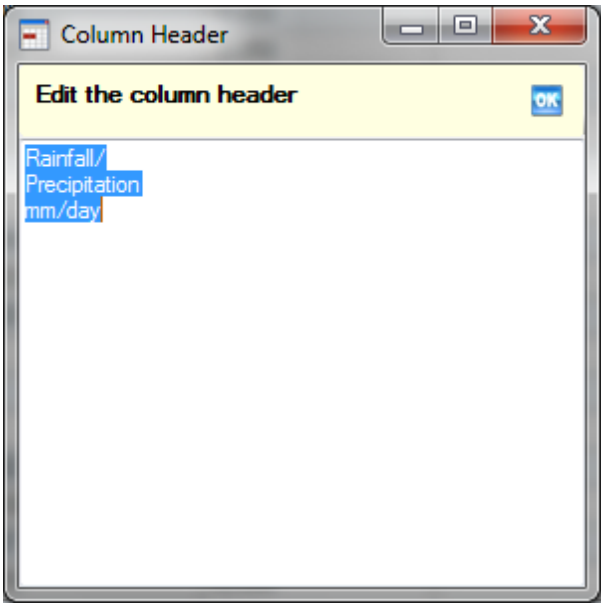

Defining a Column Header

To define a column header, users can

- **Right-click** on the existing column header for any column on the open DataView. Choose the **Edit Column Header** button from the right-click menu. In the Column Header dialog that opens, enter the desired column header text.
- Open the **Column Properties** section and choose the **Column Header** property on the right side of the Column Properties section.

7.10.3 DataView Column Icons

DataView Column Icons

Depending on the status of the selected Location:Parameter as a column or the database, various icons may be displayed automatically in the column header area as well as the status bar area at the bottom of the displayed DataView. These icons help to identify important information about the selected column or cell.

	Calculator Icon - denotes that the selected Location:Parameter has an attached Formula. Right-click on the column header and select **Formula: (Formula Name)** to display the attached formula information.

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	Hourly L:P Icon - denotes that the selected Location:Parameter is flagged as an Hourly Location:Parameter.
	Locked Data Icon - denotes that for a period of time, based on the current Locked Data setting, access to the selected Location:Parameter is denied as it is locked.
	Protected Icon - denotes that the selected Location:Parameter is flagged as Protected and data entry is denied.
	Restricted Icon - denotes that the user is restricted to the Location:Parameter based on LP Permissions in the security section.
	Upper Limit - denotes that the selected Location:Parameter has a data entry limit set for the Upper Entry Limit
	Lower Limit - denotes that the selected Location:Parameter has a data entry limit set for the Lower Entry Limit
	Dual Limit - denotes that the

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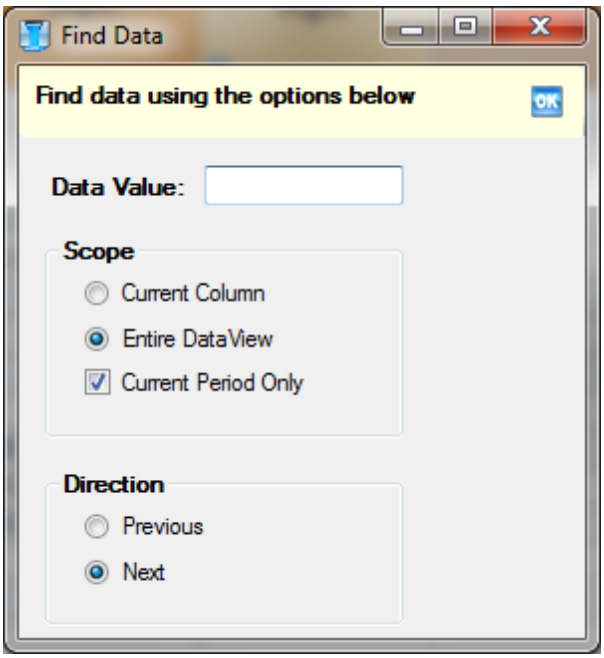
	selected Location:Parameter has both Upper and Lower Entry Limits defined.
^	**Entered Value Limit (Upper)** - displayed in each data cell when an entered value has exceeded the Upper Entry Limit defined for the selected Location:Parameter
v	**Entered Value Limit (Lower)** - displayed in each data cell when an entered value has exceeded the Lower Entry Limit defined for the selected Location:Parameter

7.10.4 Find Data

Find Data

Data values in a DataView may be easily found by selecting the **Find** icon on the Edit ribbon.



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Finding Data

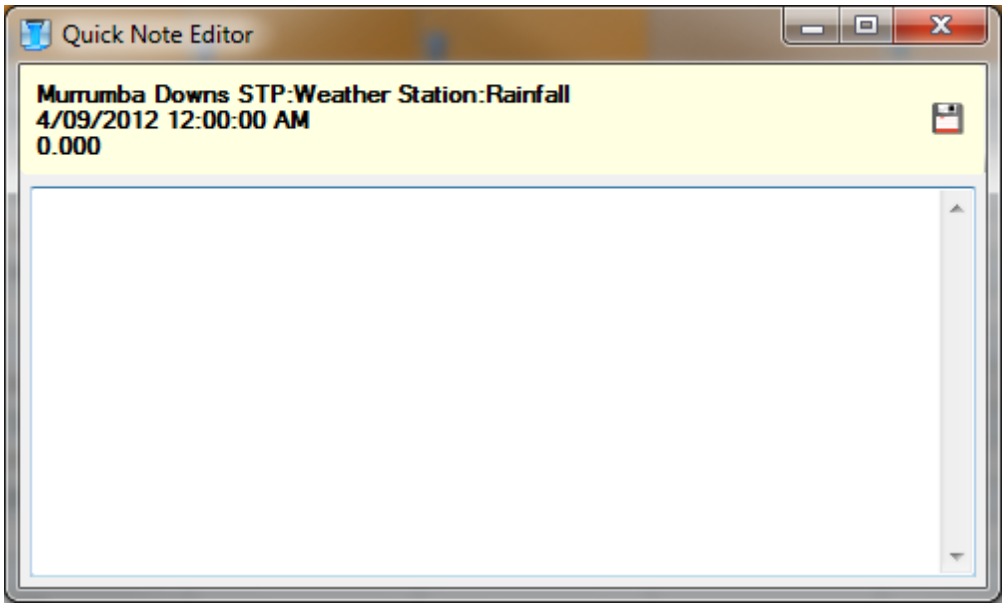
1. Enter the partial phrase or criteria (0 to 255 characters) desired for the **Data Value** to be found.
2. Select either the **()Current Column** or **()Entire DataView** radio button to set the Scope of data searched.
   - Mark the **[ ] Current Period Only** checkbox if the search should stay within the current DataView time period. Otherwise the search will continue through all available data.
3. The search Direction may be specified by selecting the **()Previous** or **()Next** radio button.
4. Press the **[OK]** button to begin searching records.

If a matching data value is found, the cell which contains the data will be highlighted.

Press the **<F3>** key to repeat the find.

7.10.5 Quick Notes

The Quick Note Editor dialog box allows notes to be easily entered and linked to the current Location:Parameter data cell. Notes may also be viewed and printed from the Notes section of the Operator10 - Wastewater main application.



Creating Quick Notes

The following options allow users to create Quick Notes:

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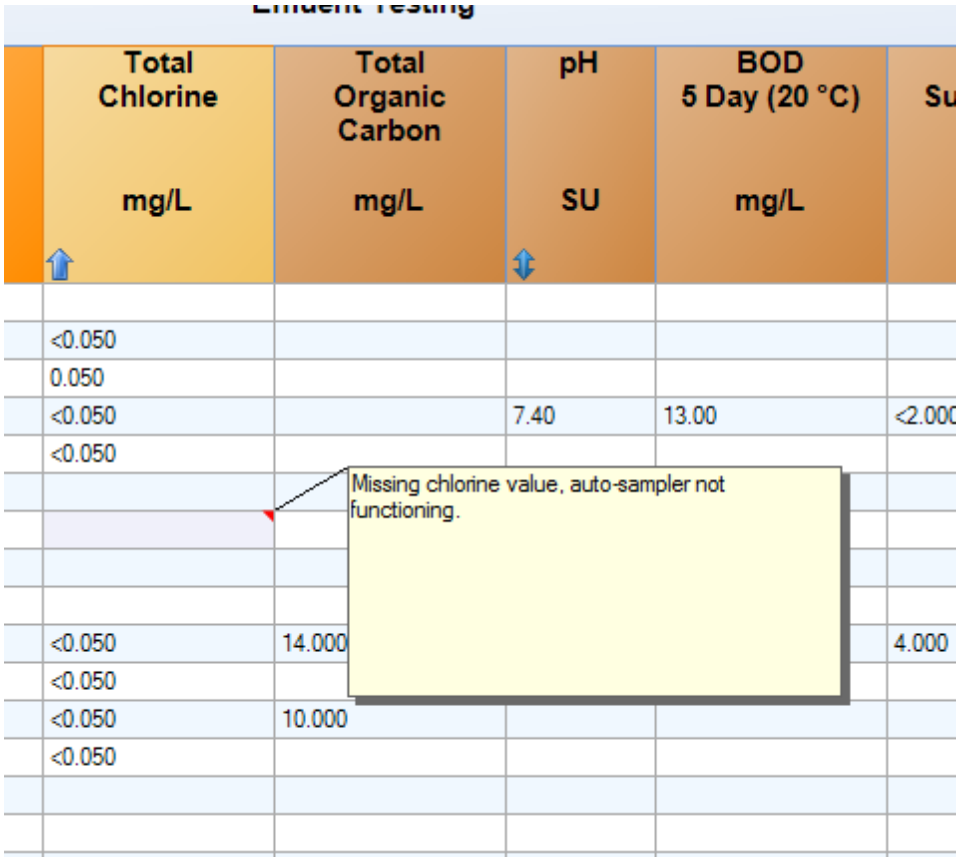
- **Right-click** on any data cell and choose **Quick Note Editor** from the right-click menu
- **Select** any data cell and choose **[Quick Note]** from the **Edit** ribbon. Choose **View/Edit Quick Note** from the menu that opens
- **Select** any data cell and use the keyboard shortcut **Ctrl + N** to **View/Edit the Quick Note**



Quick Note Display

NOTE: Cells which have a corresponding Quick Note are denoted with a small triangle in the upper-right hand corner. The highlight color may be specified in the DataView Properties setup section.

Viewing Quick Notes

To view a Quick Note, either -

- **Hover** the mouse cursor over a data cell displaying the small triangle in the upper-right corner, or
- **Right-click** on any data cell and choose **Quick Note Editor** from the right-click menu

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- **Select** any data cell and choose **[Quick Note]** from the **Edit** ribbon. Choose **View/Edit Quick Note** from the menu that opens
- **Select** any data cell and use the keyboard shortcut **Ctrl + N** to **View/Edit the Quick Note**

Deleting Quick Notes

In the event that Quick Notes are no longer valid, open the Quick Note Editor from the instructions shown above and clear all data from the Quick Note data field. Click **[Save]** to save and clear the Quick Note.

7.10.6 Import Data

Import

Data can be imported directly into the DataView based on a known file format. Based on the file format chosen, the import process using the DataView will import data with options.

Beginning an Import

To begin an import, navigate to the **Tools** ribbon and select **[Import]** to begin.

In the Select a File to Import window that opens, on the lower-right side of the window, select from the following file types to import:

- **Text Files (*.csv, *.txt)**
- **Excel Files (*.xls)**
- **XML Files (*.xml)**

Once the file type is selected, navigate to the file location and select the desired file to be imported. Click **[Open]**.

Import Options

Based on the selected file type to imported, file format options may need to be provided:

Text File Import Options
For importing text files, the following options are available:

- **First Row is Column Headers** - Check this box if the import file contains a first row of data that are for column headers
- **First Column is Data Date** - Check this box if the import file contains a first column of data that is date
- **Has Summary Rows** - Check this box if the import file contains summary rows at the end of the date/data rows

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Click [OK] **[OK]** to begin the import.

Export File Import Options

> ***NOTE:*** Presently no data options exist, press the **[OK]** button to begin the file import.

XML/Text File Import Options

> ***NOTE:*** Presently no data options exist, press the **[OK]** button to begin the file import.

7.10.7 Export Data

Export

Data can be exported from the DataView using one of the available formats for export. Each format provides the user with individual options and functionality.

Creating an Export file

To begin creating an export file, go to the **Tools** ribbon and choose the **[Export]** button to begin.

Choose from the available options to begin the export process:

- eDV - Exports data in the **E**lectronic **D**ata**V**iew format ready for use with the eDV Viewer
- CSV - Exports data into a **C**omma **S**eparated **V**alues file, suitable for use with a text editor or Microsoft Excel
- Excel - Exports data as a Microsoft **Excel** formatted file
- XML/Text - Exports data in a **XML** formatted file

File Export Options

Each export options provides the user with data export options, if applicable.

eDV Export Options
When exporting data using the **eDV** format, the process and options are as follows:

1. From the **Tools** ribbon, click the Export button
2. From the Export menu, choose **eDV**
3. Enter the **Export Start Date** and **Export End Date**
4. If desired, check the checkbox for **Export as Template:** (see **Note** below)
5. Click [OK] **[OK]**
6. Select a file location and enter a file name using the Explorer window that opens
7. Click **[Save]**

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NOTE: The **eDV Viewer** now supports a template file format which allows users to export a .edv**t** file that when opened in the eDV Viewer stand-alone application, prompts the user for a date range and upon completing data entry, requires the user to save the entered data as a .edv file. eDV Template files are considered read-only and do no allow for adjustment once exported.

CSV Export Options
When exporting data using the **CSV** format, the process and options are as follows:

1. From the **Tools** ribbon, click the Export button
2. From the Export menu, choose **CSV**
3. Select a file location and enter a file name using the Explorer window that opens
4. Click **[Save]**
5. Choose from the available options:
   - **First Row is Column Headers** - Exports column header text as first row of data
   - **Include Summary Rows in Export** - Exports summary information displayed at the bottom of the DataView
   - **Non-Data in Quotes** - Exports non-numeric data in quotes ("") for text handling
   - **Data in Quotes** - Exports numeric data in quotes ("")
   - **<, >, ~ Exported with Qualifier** - Exports qualifying symbols, less-than (<), greater-than (>) and non-detect (~), with data
1. Click **[OK]**

Excel Export Options
When exporting data using the **Excel** format, the process is as follows:

6. From the **Tools** ribbon, click the Export button
7. From the Export menu, choose **Excel**
8. Select a file location and enter a file name using the Explorer window that opens
9. Click **[Save]**

NOTE: Data and most formatting options from the DataView are preserved during the export to Excel. Colors, however, are not supported in the export process.

XML/Text Export Options
When exporting data using the **XML/Text** export option, the process is as follows:

10. From the **Tools** ribbon, click the Export button
11. From the Export menu, choose **XML/Text**
12. Select a file location and enter a file name using the Explorer window that opens
13. Click **[Save]**

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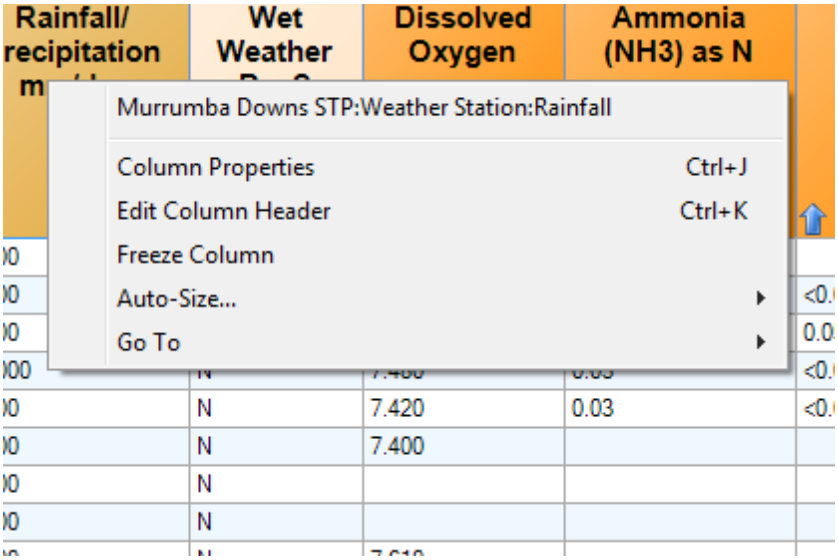
NOTE: Data, date and location:parameter information are exported from the DataView using an XML format. Data exported could be parsed using any third-party XML editing tool, text editor and/or Microsoft Excel.

7.10.8 Freeze Columns

Freeze Columns

Columns can be temporarily moved to the left side of the DataView and be locked in place while scrolling. Any number of columns can be frozen as needed. Columns can be unfrozen once set or upon closing the DataView, the columns will be returned to their original locations.



Freeze Columns

To freeze a DataView column, right-click on the column header and choose the **Freeze Column** option from the right-click menu.

Unfreeze Columns

To unfreeze a DataView column, right-click on a column header that has been frozen/ locked to the left side and choose the **Unfreeze Column** option from the right-click menu.

7.10.9 Right-Click

Right-Click Options

Many functions of the DataView application can be performed from the right-click menu. Depending on where the right-click is performed AND what items have been selected, the menu options will be displayed.

DataView Info Cell

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In the top-left corner of every DataView is an Info Cell that can be used to display DataView information such as the name, date range and type of DataView. Right-click options on the DataView Info Cell include:

- **Column Properties:** Opens the DataView Column Properties section
- **Autosize All Columns:** Automatically re-sizes all columns based on current text present in the Column Header

Column Header

Right-clicking on any column header in the DataView will provide access to the following options:

- **Facility:** Location:Parameter: The first option in the right-click menu displays the Facility:Location:Parameter (F:L:P) that is represented as a column
- **Formula:** Depending on the F:L:P selected, the Formula associated with the F:L:P will be displayed, click on the Formula text to display the complete formula information
- **Limit(s):** Depending on the F:L:P selected, if limits have been defined, Upper and/or Lower Limits will be displayed
- **Column Properties:** Opens the DataView Column Properties section
- **Edit Column Header:** Opens the Column Header edit window
- **Freeze Column:** Select this option to Freeze the column to the left side of the DataView
- **Autosize...:** Choose from the available options to automatically re-size the width of the selected column or all columns in the DataView
- **Go To:** Choose from the list of F:L:Ps displayed as columns on the open DataView to be taken to that column directly

Data Cell

Right-click on any cell in the DataView and select from the following options:

- **Column Properties:** Opens the DataView Column Properties section
- **Add Data:** Opens the Add Data dialog for specific date/time data entry for the selected column/F:L:P
- **Alpha Code:** Opens the Alpha Code picklist and based upon selection, inserts the selected Alpha Code into the data cell
- **Cut:** Select **Cut** to remove the entered data from the data cell(s) and place it on the Windows Clipboard for use
- **Copy:** Select **Copy** to make a copy of entered data from the data cell(s) and place it on the Windows Clipboard for use
- **Paste:** Select **Paste** to paste data stored on the Windows Clipboard into the selected cell(s)
- **Delete:** Select **Delete** to delete data stored in the selected data cell(s)
- **Show Summary:** Opens the Block Summary dialog displaying summary information for the selected cell(s) data

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- **Read Selected Data:** Allows a utility to read back the data entered in the DataView cell(s)
- **Print Selected Data:** Prints the data from the selected cell(s)
- **Quick Note Editor:** Opens the Quick Note Editor allowing the user to enter, edit or view a quick note associated with the selected data cell
- **Calculator:** Opens a calculator allowing the user to quickly perform a hand-calculation, the result of which is entered into the data cell
- **Review Data:** Opens the Review Data section which allows users to view recent values (all data can be displayed as an option) entered in the database

Row Header

Right-click on any row header to select from the following options:

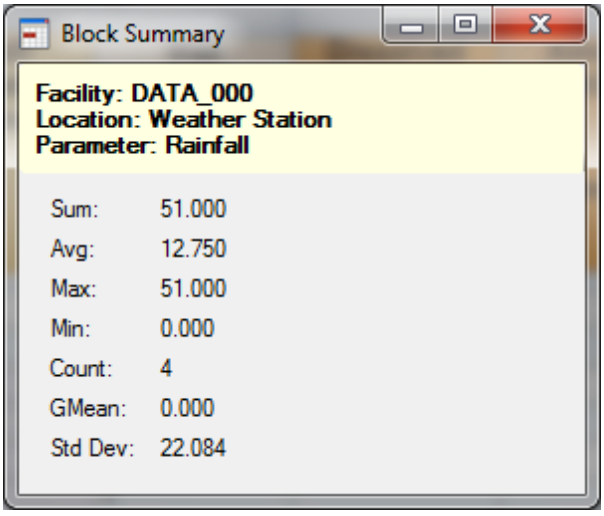
- **Go To...:** Opens a Calendar allowing users to select a date to browse to

> ***NOTE:*** If the selected date from the Calendar is not displayed as part of the current DataView date range, navigation to the selected date is not performed.

7.10.10 Block Summary

Block Summary

Use the Block Summary feature to display a summary of data based on the selected data cells from the DataView.



Accessing Block Summary

To open the Block Summary dialog, highlight a selection of data cells in any DataView. With a selection of cells made, **right-click** on the cells and choose **Block Summary** from the right-click menu.

Summaries

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Available data summaries include:

- **Sum**
- Average (**Avg**)
- Maximum (**Max**)
- Minimum (**Min**)
- **Count**
- Geometric Mean (**GMean**)
- Standard Deviation (**Std Dev**)

7.10.11 Date Format Options

Date Format

The date format displayed in the Row Header cell is able to be set using pre-defined options available in the DataView Properties section as well as the options shown below.

Directly enter the format string using the options displayed below:

d - single-digit day of month (1 - 31)
dd - 2-digit day of month (01 - 31)
ddd - abbreviated name of day of the week (Mon)
dddd - full name of day of the week (Monday)
h - single-digit hour, 12 hour clock
hh - 2-digit hour, 12 hour clock
H - single-digit hour, 24 hour clock
HH - 2-digit hour, 24 hour clock
m - single-digit minute (0- 59)
mm - 2-digit minute (00 - 59)
M - month number (1 - 12)
MM - 2-digit month number (01 - 12)
MMM - abbreviated month name (Dec)
MMMM - full month name (December)
s - single-digit second (0 - 59)
ss - 2-digit second (00 - 59)
tt - AM or PM for the time
y - single-digit year (0 - 99)
yy - 2-digit year (00 - 99)
yyyy - 4-digit year
: - time separator
/ - date separator

Examples:

dd ddd = 01 Fri
dd ddd MMM = 01 Fri Feb
MMMM dd yyyy = February 01 2013
H:m ddd dd MMM = 5:10 Fri 01 Feb

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7.11 eDV (Electronic DataView)

eDV Documents

An **eDV Document** is a special electronic document representing an Operator10 - Wastewater **DataView**. (DataViews are the spreadsheet-style grids where data is entered, viewed , imported, exported, or printed. Columns represent Location:Parameters and Rows represent dates or summary information.) The default (and recommended) file extension is ".eDV", which allows Windows to associate the files with the eDV Viewer. An eDV Document contains only Facility, Column Headers, Location:Parameters, and a particular month's data. It does NOT include Entry Limits, Data Notes, Alpha Code descriptions, or Summaries. (Summaries are recalculated in the eDV Viewer.)

See the following help topic for information on how to create an eDV export file: eDV Export Options

Upon receiving an eDV Document, either by e-mail or another method, the user opens it with the **associated eDV Viewer**. The eDV Viewer displays the data in the familiar DataView format, including Headers and recalculated basic Summary information. The viewer supports editing data values (where the original was editable), and Windows clipboard functions. The eDV Document may be Saved or E-mailed to another user. If the eDV Viewer is on a workstation where Operator10 - Wastewater is running, a "Transfer" ribbon item is also available, which transparently puts the edited data into the database using the Facility, Location:Parameter, and Date of the eDV.

In practice, one user may e-mail an eDV to a second user, who may either simply view the data, copy it to other applications via the Windows clipboard, save it into their own database, or edit the data and return it so that the first user may then view and/or save the data into the original database.

Note that only the Operator10 - Wastewater DataView application can initially "create" eDVs--the eDV Viewer simply "forwards" or "returns" the edited document. The eDV Viewer requires a very small installation, since it does not require separate database engines or other Operator10 - Wastewater products.

Topics in this section include:

- eDV Viewer
- Working with eDV
  - eDV Templates

7.11.1 eDV Viewer

eDV Viewer - Main Window

The eDV Viewer main window uses a ribbon-style toolbar to provide access to features and functionality. The following options are available as menu options in the View ribbon:

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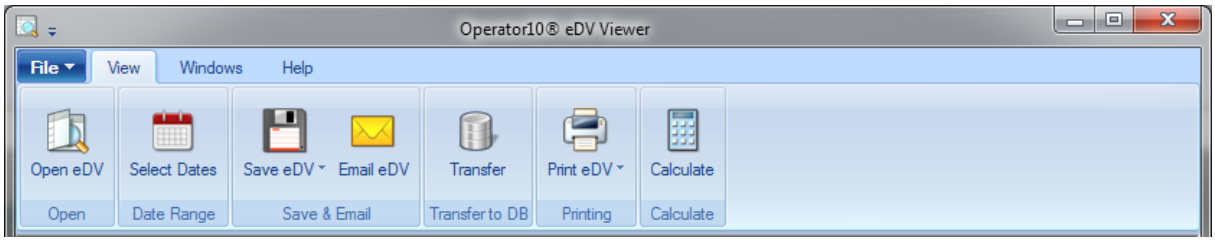

View ribbon functions

The following options are available in the Home ribbon (and are discussed as they appear in the button groups):

Open:

- **Open eDV** - Press the **[Open eDV]** button to browse for and open an eDV

Date Range:

- **Select Dates** - Press the **[Select Dates]** button to select a date range for the open eDV

Save & Email:

- **Save eDV** - Press the **[Save eDV]** button to choose from the following options:
  - **Save eDV** - Saves the eDV with all data entered
  - **Save eDV As** - Prompts the user to save the eDV with a new file name and/ or location
- **Email eDV** - Press the **[Email eDV]** button to send the eDV by email as an attachment to a recipient

Transfer to DB:

- **Transfer** - Press the **[Transfer]** button to transfer the data into the Operator10 - Wastewater database

> ***NOTE:*** The transfer of data is only available when the Operator10 - Wastewater full application has been installed and is available on the same computer.

Printing:

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- **Print eDV** - Press the **[Print eDV]** button to choose from the following options:
  - **Print eDV** - Sends the eDV direct to the printer
  - **Preview eDV** - Previews the eDV and provides an opportunity to print during Preview

Calculate:

- **Calculate** - Press the **[Calculate]** button to calculate/refresh the parameter column summaries for the eDV

Window Ribbon functions

The following options are available in the Window ribbon (and are discussed as they appear in the button groups):

Arrange Windows:

- **Arrange Windows** - Press the **[Arrange Windows]** button and select from the drop-down menu:
  - **Cascade** - arrange all open eDV Windows in normal overlapping windows, with the current eDV window in front
  - **Tile Horizontally** - arrange all open eDV Windows in tiled windows, with the current eDV window at the top left
  - **Tile Vertically** - arrange all open eDV Windows in tiled windows, with the current eDV window at the top left
  - **Arrange Icons** - arrange any iconized/minimized windows along the lower left of the eDV application window.
  - **Minimize All** - minimize all open eDV windows
  - **Restore All** - restore all minimized eDV windows
- **Switch Window** - Press the **[Switch Window]** button to select from a list of open eDV windows to switch to

7.11.2 Working with eDV

Working with eDV

This topic provides basic information for working with the eDV Viewer.

eDV Presentation

Data is displayed in a row/column format similar to a spreadsheet. **Columns** are presented and represent the Location:Parameters defined in the originating DataView in Operator10 - Wastewater.

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Column Headers are provided based on the originating DataView and correspond to the Location:Parameter of the values listed. Columns may be **resized** by dragging the right edge of each Column Header. **Left-clicking** on a Column Header **selects the entire column**. Columns which correspond to calculated Location:Parameters in the original DataView (shown with **Red Header Text**) are **not editable**.

Row Labels correspond to the Date or Summary of the values listed. **Left-clicking** on a Row Label **selects the entire row**.

Left-clicking on the **square** in the upper left corner of the grid (where Column Headers and Row Labels intersect) will **Select All** cells.

The **Grid**, similar in style to a spreadsheet, shows all data values for the current month. Each **Cell** is identified by the Column (Location:Parameter) and Row (Date or Summary). Data may be edited or entered in the Current Cell, identified by a dotted line around its perimeter.

Data values are stored internally with 15 significant digit Precision. Internal values are unaffected by the number of display digits or following zeros. Numbers may range to ±1.0E16.

NOTE: Data is conveniently entered directly into any grid cell by selecting the cell and then entering the value via the keyboard. Pressing the Enter or Tab key moves to the next cell. (See Data in theOperator10 - Wastewater main application for additional information on Data Types.)

Data is automatically recognized by its format:

- Any entry containing a colon (:) is a Time value.
- Any entry containing a slash (/) is a Date value.
- Any entry beginning with a number, plus (+), or minus (-) is a Numeric value.
- Any entry beginning with a Less Than (<) is a Less Than value.
- Any entry beginning with a Greater Than (>) is a Greater Than value.
- Any entry beginning with a Tilde (~) is a Non-Detect value.
- Any entry beginning with an Alphabetic character (A, B, ...) is an Alpha Code.

eDV Summaries

Data summary values are provided by default at the bottom of each column. When opened initially, summary values will be calculated based on the data that may already be present.

Press the **[Calculate]** button to recalculate summary values.

7.11.2.1 eDV Templates

eDV Templates

eDV Templates (file extension **.edvt**)can be created when exporting the original

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DataView in order to provide a read-only copy of the eDV. eDV Templates, when opened, allow for data entry to be performed as normal. However, the eDV must then be saved as a new eDV while the template file is unchanged and can be reopened as a blank.

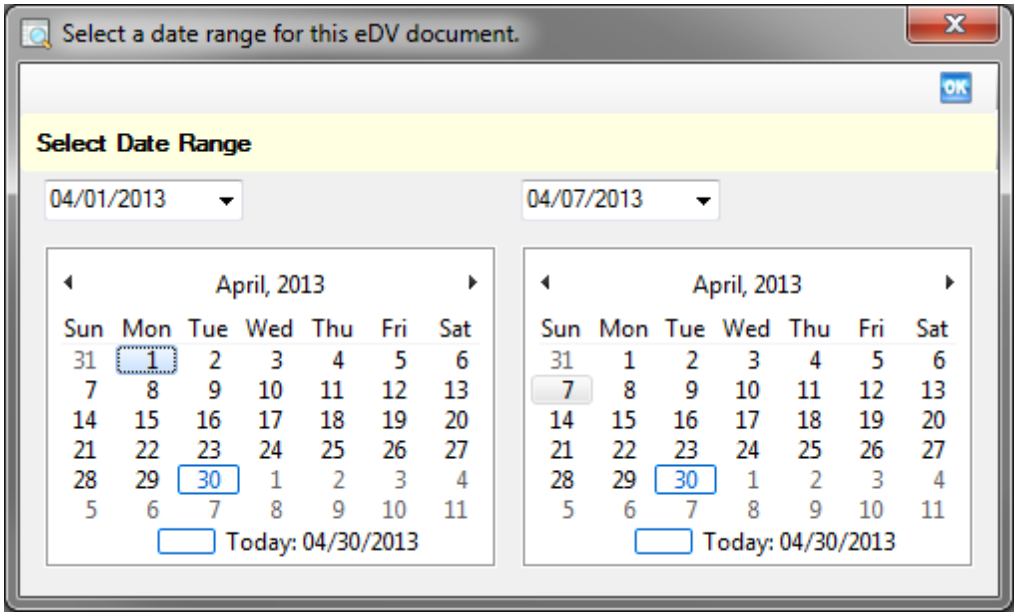
Create eDV Templates

eDV Templates can be created when exporting from the DataView application. For more information, see the following topic: eDV Export Options

Opening eDV Templates

When opening the eDV Template file, the eDV Viewer will prompt for a date range. Enter the start and end date for the eDV.

Once the date is provided, the eDV will open and allow for data entry to begin.



Saving eDV Templates

eDV Templates are not saved with data, but instead, are saved as eDV files while the template remains blank. Once data entry is complete, if the eDV is to be saved, choose the **Save eDV As** option from the **[Save eDV]** button in the ribbon.

At the prompt, enter the file name in the **File name:** field and navigate to a location to which the file will be saved. Press the **[Save]** button to finish the Save As process.

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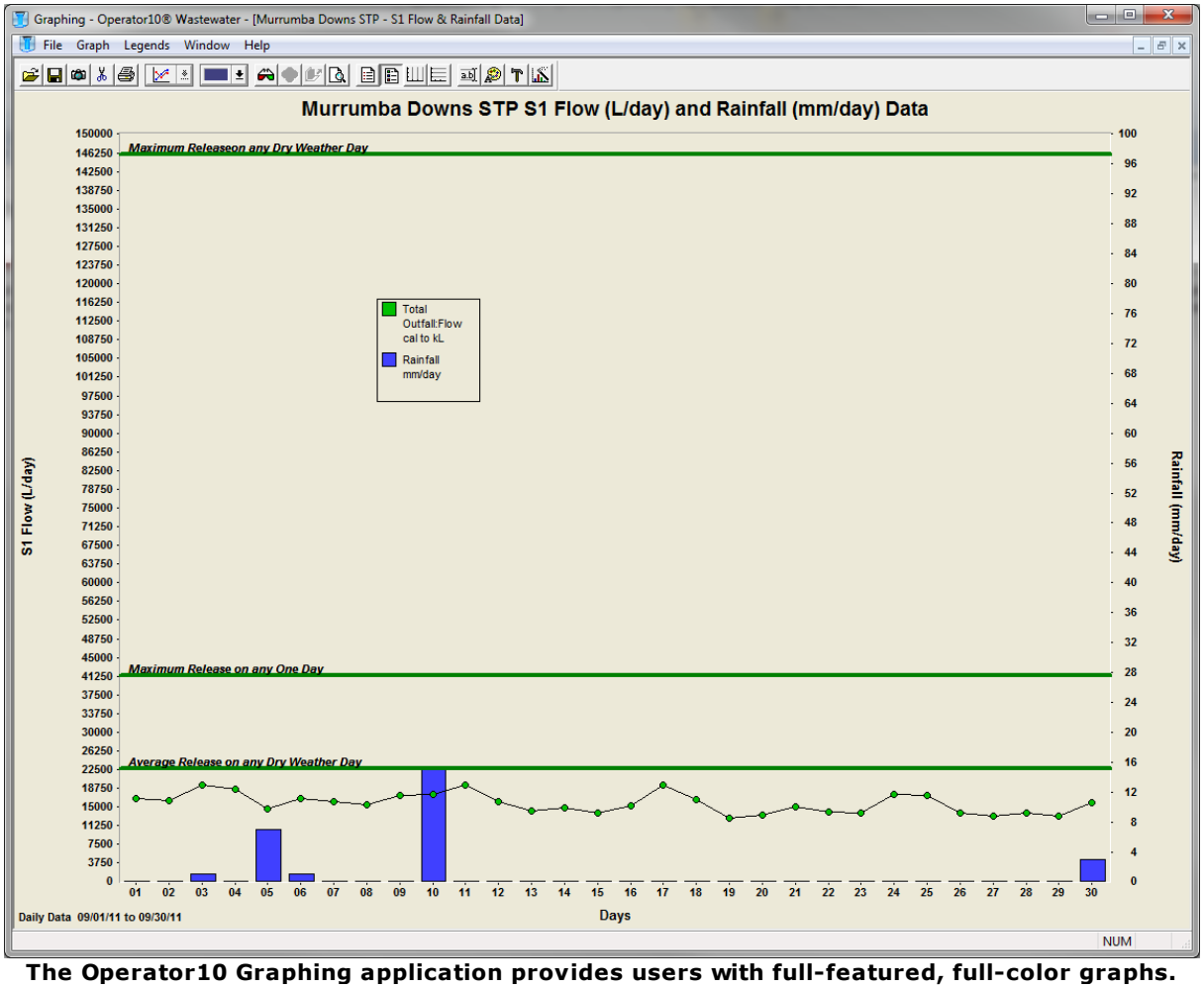
Part

8 Graphing

Graphing

The Graphing application in Operator10 - Wastewater allows users to produce full-color, 2- and 3-dimensional graphs using any data stored in the Operator10 - Wastewater database. Data can be graphed for hourly and daily values, days, weeks, months and years. The Graphing application allows users to produce a variety of graph/chart types with titles, legends, scale, dual Y-axis plotting, displayed values, linear regression, constant lines and bands, limit details and much more.


Graphing - Operator10® Wastewater - [Murrumba Downs STP - S1 Flow & Rainfall Data]
File Graph Legends Window Help
Murrumba Downs STP S1 Flow (L/day) and Rainfall (mm/day) Data
Maximum Releaseon any Dry Weather Day
Maximum Release on any One Day
Average Release on any Dry Weather Day
Total Outfall:Flow cal to kL
Rainfall mm/day
S1 Flow (L/day)
Rainfall (mm/day)
Days
Daily Data 09/01/11 to 09/30/11
NUM

The Operator10 Graphing application provides users with full-featured, full-color graphs.

Accessing Graphing

To open the Graphing application, go to the **View** ribbon/menu and choose **[Graphs]** to open the graphing application. Users will be presented with an option to open an existing graph from the Graph List, or to create a **[New]** graph.

Graphing Application Functionality

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The following options are available in the Graphing application

- Graph List
- Graph Data
- Graph Options
- Main Window

8.1 Graph List

Graph List

The Graph List is a dialog box displaying a list of items that the user may choose (pick) or edit.

To open an existing graph, highlight the item in the Graph list and press **[Select]**, or double-click on the item.

To create a new Graph, press **[New]** to open a new graph.

To filter the list and only display items which match filter criteria, enter a filter (0 to 255 characters) in the box and press **[!]**. See the Operator10 - Wastewater main application help for details on filtering.

8.2 Graph Data

Topics in this section include:

- Data Source
- Open Graph Date Range

8.2.1 Data Source

Data Source

Go to the **Graph** menu and select **Data Source...** to open the Data Source dialog.

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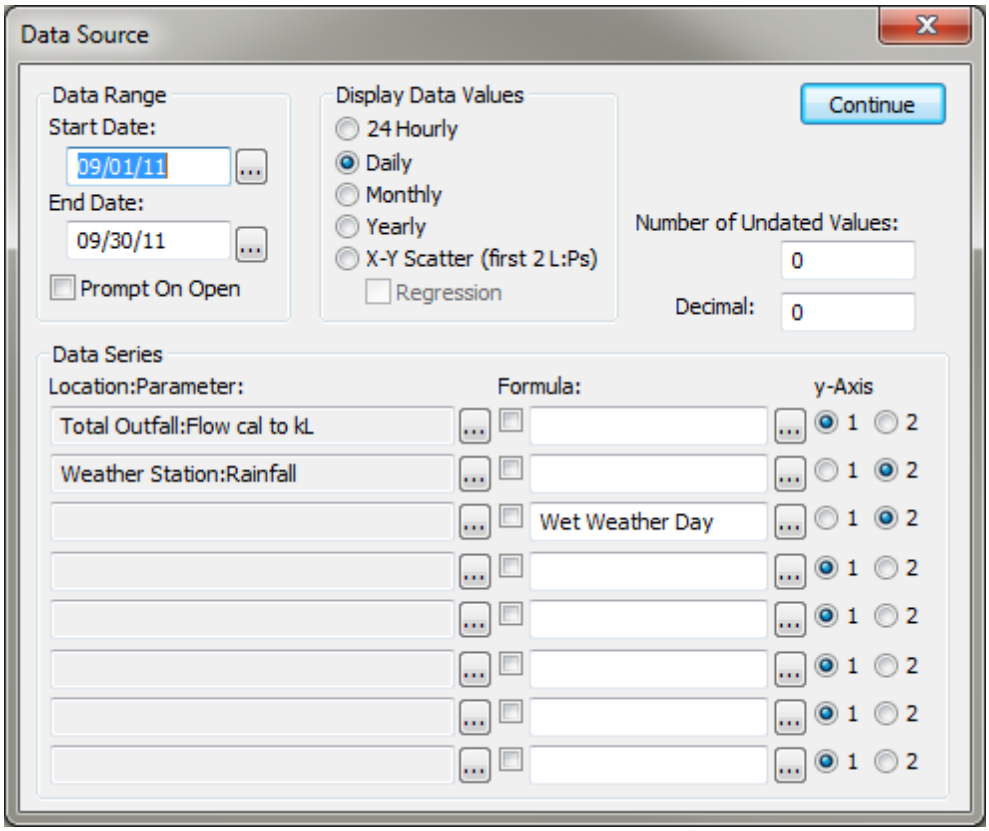

Data Source Editor

The Data Source Editor links the Graph to its underlying database by specifying the appropriate data and formulas.

- Enter a **Start Date** and **End Date** for the Data Range, or press the **[...]** popup button to choose the date from a Calendar dialog. If you wish to be prompted each time you open the graph, mark the **[ ]Prompt On Open** checkbox. Relative Dates may be entered to open the graph to dates relative to the system date.
- Select an appropriate option from the **Display Data Values** group. To graph time intervals along the x-axis (hours, days, or months, as selected by the **() 24 Hourly**, **() Daily**, **() Monthly**, or **() Yearly** radio buttons) and the Location:Parameters Data values along the y-axis, or the **() X-Y Scatter** radio button to graph the first Location:Parameter along the x-axis and the second Location:Parameter Data values along the y-axis.

  For X-Y Scatter graphs, mark the **[ ] Regression** check box to display a Linear Regression line.
- In the **Data Series** area:
  - Enter a Location:Parameter for each Data series, by pressing the **[...]** popup button and selecting from a PickList.
  - Enter a value for Decimal to display that number of places after the decimal points for all Data Series.

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- If a Formula is required, mark the **[ ] Formula** checkbox and enter the Formula Name, or press the **[...]** popup button to choose from a PickList.

> ***NOTE:*** Monthly and Yearly Graphs default to the average of monthly or yearly data unless a formula is specified. 24 Hourly Graphs default to the average of multiple data values within an hour.

> ***NOTE:*** The first several Formula Names listed in the PickList are special internal Formulas available for graphing. They include Monthly and Yearly summaries of daily data values, Daily inverse and logarithms, and Hourly summaries.

- Up to two y-axis scales are available for graphing. Select the **() 2** radio button if the Location:Parameter Data values should be graphed along a secondary y-axis.

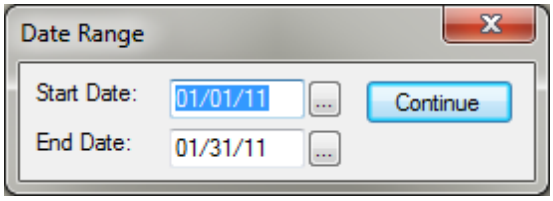
> ***NOTE:*** The Graph will be refreshed upon completion of the Data Editor dialog box

8.2.2 Open Graph Date Range

Date Range

An option, **[ ] Prompt on Open**, is available when defining the Data Source properties for any graph. This prompt, when enabled, upon opening a graph will provide the user with the ability to set the graph start and end dates. Enter a date or click the **[...]** button to use the Calendar option.

Users may also use the Relative Dates feature to provide dates relative to the current date.



8.2.2.1 Calendar

Calendar

When prompted, users will be able to select or enter dates as it applies to the start and end of data to be displayed on any given graph.

Use the calender tool to enter or select a date.

For more information, see the Date/Calendar help topic, as well as the Relative Dates topic.

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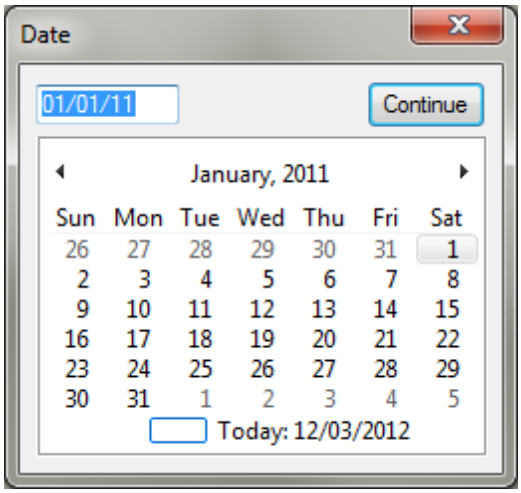


8.3 Graph Options

Topics in this section include:

- Graph Type
- Linear Regression
- Graph Data Type
- Graph Tools
- Balloons

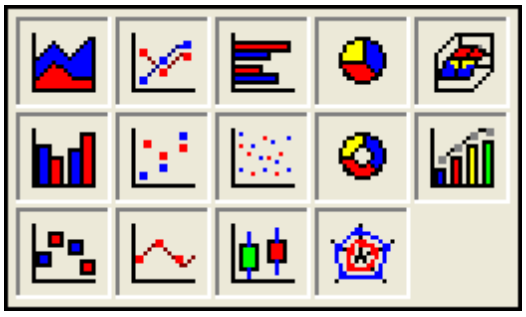
8.3.1 Graph Type

Graph Type

Graphs are available in 14 basic Graph Types, and several Multiple Types can be created by assigning different types to each Location:Parameter Series. Up to 8 Location:Parameters or Formulas can be graphed at once, using a secondary y-axis if required. Graph types, colors, patterns, point shapes, lines, multiple series types, 3-D qualities and rotation, linear or logarithmic scales, units, grids, titles, legends, fonts, and sizes are all configurable by the user.

Available basic Graph Types include:

Area, Lines, Horizontal Bars, Pie, Surface, Bars, Marks, Scatter (X-Y), Doughnut, Pareto, Cubes, Fit to Curve, [Open-]Hi-Lo-Close, Polar



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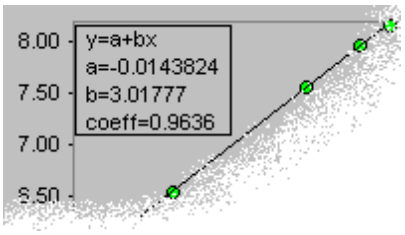
8.3.2 Linear Regression

Linear Regression

A **Linear Regression** line can be shown on the graph for **X-Y Scatter** graphs. Mark the **[ ] Regression** checkbox in the Data Editor. The slope, intercept, and correlation coefficient values will be shown in the upper left corner of the graph.



8.3.3 Graph Data Type

Graph Data Type/Range

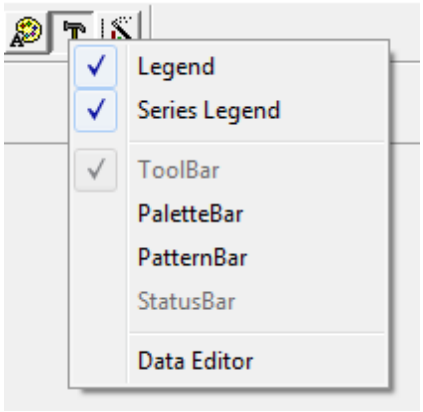
The **Data Type** and **Date Range** may be shown at the lower left side of the graph by marking the **Graph Data Type/Range** menu item. The text will use the same font as the x legend.

> ***NOTE:*** If the graph is printed, the page number will also be printed at the lower right side of the graph.

8.3.4 Graph Tools

Graph Tools

The **Graph Tools** toolbar item provide quick access to commonly used features and functionality.



(Image contains hotspots - click options to learn more!)

8.3.5 Balloons

Balloon

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Popup **Balloons** are available for additional information about Graphed Data, x-axis Legends, and the Toolbar.

LeftDoubleClick (or Right-click) on **Graphed data** to display a Balloon showing legends and actual Data value.

LeftDoubleClick (or Right-click) on **x-axis Legend** to display a Balloon showing full legend text.

Right-click on a **Toolbar Button** to display a Balloon showing a description of the Tool.

8.4 Main Window

Topics in this section include:

- Menus
- Toolbars

8.4.1 Menus

Topics in this section include:

- File menu
- Graph menu
- Legends menu
- Window menu
- Help menu

8.4.1.1 File menu

Topics in this section include:

- Facility
- Open Graph
- New Graph
- Close
- Save/Save As
- Print

8.4.1.1.1 Facility

Facility

Go to the File menu and choose **Facility** to open a list of Facilities contained in the opened database. Select from the list and press **[Select]** to open a Facility.

> ***NOTE:*** The Graphing application maintains a contextual reference to the current facility that a user selects. While the Location:Parameter picklist is capable of showing multiple facilities-worth of L:Ps, the Graphing application will only be able to

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work with the Location:Parameters of the current facility.

Open Graph

Use the **File** menu option and choose the **Open Graph** option to select a graph from the current facility.

8.4.1.1.2 Open Graph

Open Graph

Go to the **File** menu and choose **Open Graph** to display the Graph List.

Highlight an existing Graph from the list and press the **[Select]** button to open the graph in a new window.

Press the **[New]** button to open a new window containing an empty graph.

8.4.1.1.3 New Graph

Create a New Graph

To create a new **Graph**, perform one of the following actions:

- Go to the **File** menu and choose **New Graph...**
- Go to the **File** menu and choose **Open Graph...** and click the **[New]** button

Performing either of the above actions will begin the process of creating a new graph and take the user to the **Data Source Editor** dialog. For more information, see the help topic for Data Source.

8.4.1.1.4 Close

Close

Go to the **File** menu and choose **Close** to close the current graph. Users can also click the small **[X]** that appears in the upper-right hand corner of the graph to close the graph.

8.4.1.1.5 Save/Save As

Save/Save As

Go to the File menu and choose the **Save** menu item to save a Graph as the same Graph Name as it was opened previously.

NOTE: Choosing Save does not ask for confirmation before overwriting the existing graph. The existing graph will be replaced with the current Graph.

Choose the **Save As** menu item to save a Graph as a new Graph Name from what it was opened previously. Enter a Graph Name, or press the **[...]** popup button to choose a Graph Name from a PickList.

Save may also be chosen by pressing the appropriate Toolbar button.

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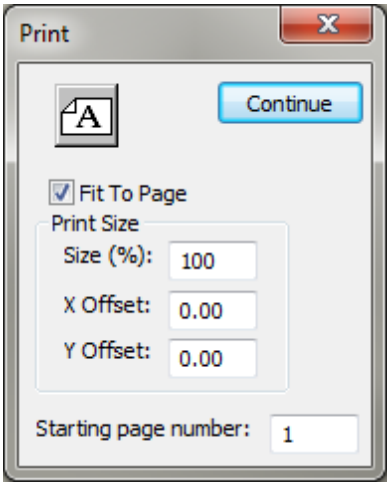
8.4.1.1.6 Print

Print

Go to the **File** menu and choose **Print** to print the open graph. The print prompt that is first displayed contains various options related to printing the graph.



Print Options

The following print options are available:

- **Orientation:** Click the orientation button to switch between portrait and landscape orientations
- **[ ] Fit to Page:** Check the Fit to Page option to force the graph to be printed on 1 sheet of paper
- **Print Size:**
  - **Size (%):** Enter a value (0-100) to define the size, in percent; the graph will be displayed at the entered percentage
  - **X Offset:** Enter a numeric value, in inches, to which the graph will be displayed from the top of the printed page
  - **Y Offset:** Enter a numeric value, in inches to which the graph will be display from the left of the printed page
- **Starting page number:** Enter a numeric value to set the page number to be printed

Click **[Continue]** to begin printing.

8.4.1.2 Graph menu

Topics in this section include:

- Data Source

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- Constants Editor
- Limits Editor
- Refresh
- Graph Properties
- Copy Options
- Automatic Scale
- Fonts

8.4.1.2.1 Data Source

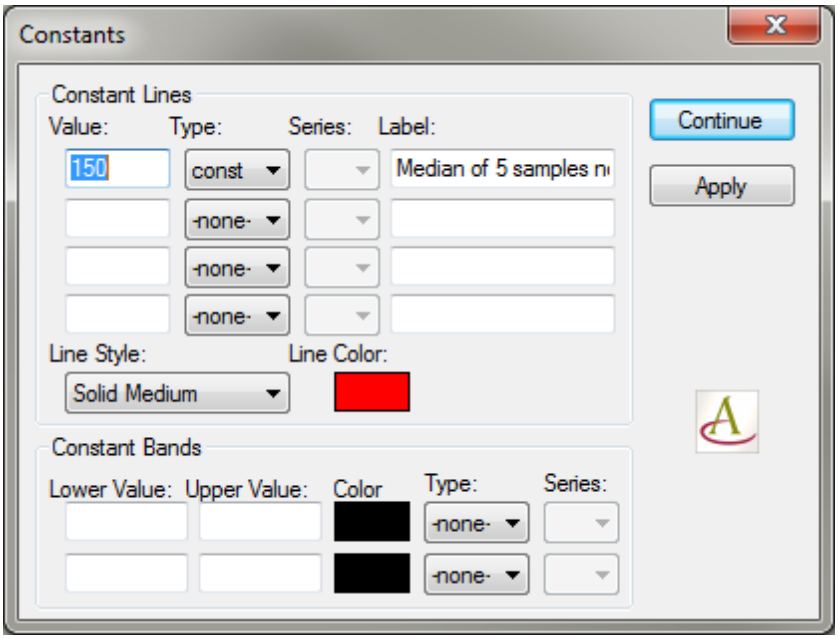
Data Source

See the Data Source Editor topic for more information.

8.4.1.2.2 Constants Editor

Constants Editor

The **Constants Editor** determines Constant Lines and Bands on the graph.



Constant Lines

Select a **Type** of **"-none-"** if the Constant Line should not be shown.
Select a **Type** of **"const"** if the Constant Line should always be the supplied Value. Enter a numeric Value for each const Type.
Select a **Type** of **"avg"**, **"max"**, or **"min"** if the Constant Line should be recalculated whenever the graph is refreshed. Select the Series to be used for the summary. The Value is optional, and displays the value from the most recent refresh.

A **Label** (0 to 255 characters) may also be entered for each Constant Line.

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Choose a **Line Style** from the drop down Listbox. Left-click on the **[Line Color]** button to choose a color from a Windows Common Dialog.

Constant Bands

Select a **Type** of **"-none-"** if the Constant Band should not be shown.
Select a **Type** of **"const"** if the Constant Band should always be between the supplied Values. Enter a numeric Lower and Upper Value for each const Type.
Select a **Type** of **"max-min"**, **"2stdev"**, or **"3stdev"** if the Constant Band should be recalculated whenever the graph is refreshed. Select the Series to be used for the summary. The Values are optional, and display the values from the most recent refresh.
Left-click on the **[Color]** button to choose a color from a Windows Common Dialog.

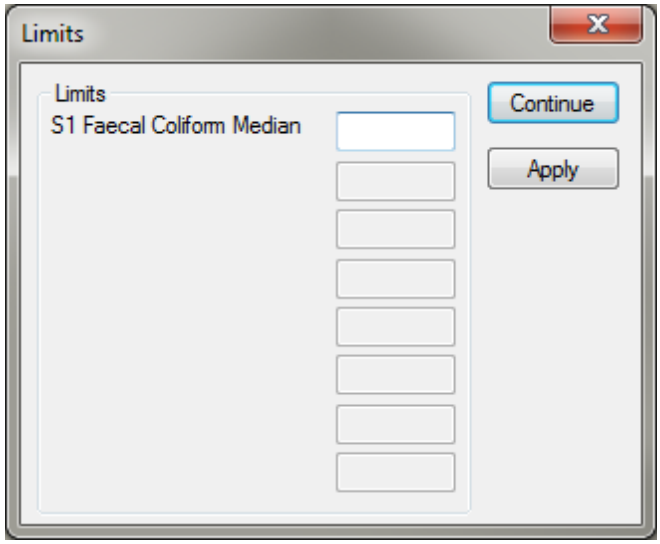
8.4.1.2.3 Limits Editor

Limits Editor

Go to the Graph menu and choose **Limits Editor...** to display the Limits Editor dialog.

The Limits Editor determines limits shown on the graph. Limits are shown for Bar, Line, Mark, Cube, and Fit to Curve Graphs.

For each Series, enter a Limit value.



8.4.1.2.4 Refresh

Refresh

Select the **Graph** menu item, **Refresh** to Refresh the Graph. Refresh transfers data from the underlying database to the Graph and calculates formula values. If the Default Legends menu item is marked, all legend text is updated. In a multi-user environment, Refresh always obtains the most current data.

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8.4.1.2.5 Graph Properties

Graph Properties

Several types of Graph Properties may be set from menu items or Toolbar buttons, and dialog boxes.

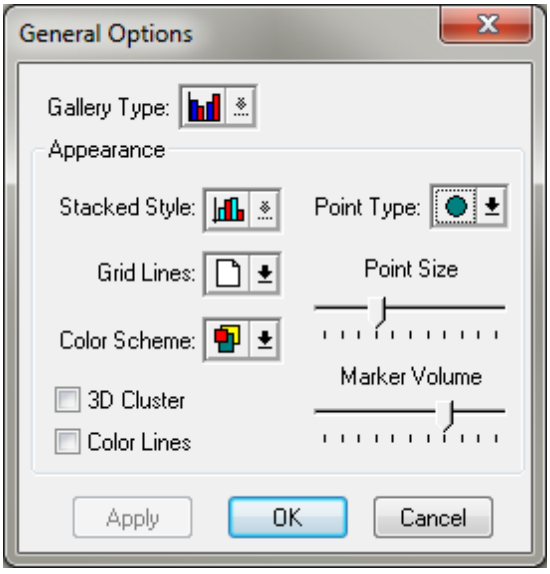
- **General Properties** include basic Graph Type, Appearance, Grids, and Color/Pattern options for the entire Graph.
- **Series Properties** include Graph Type, Appearance, and Color options for each Location:Parameter.
- **Scale Properties** include Linearity and Scaling options for the x and y-axis.
- **3-D Properties** allow 2-Dimensional or 3-Dimensional Graphs, including full 3-D Rotation and Shadows.
- **Title Properties** include a Top, Bottom, Left, and/or Right Titles for the Graph.
- **Font Properties** may be set individually for Titles, Legends, Legend Boxes, and Data Values.

Graph Properties may also be chosen by pressing the appropriate Toolbar button.

8.4.1.2.5.1 General Properties

General Properties

General Properties include basic Graph Type, Appearance, Grids, and Color/Pattern options for the entire Graph.



8.4.1.2.5.2 Series Properties

Series Properties

Series Properties include Graph Type, Appearance, and Color options for each Location:Parameter.

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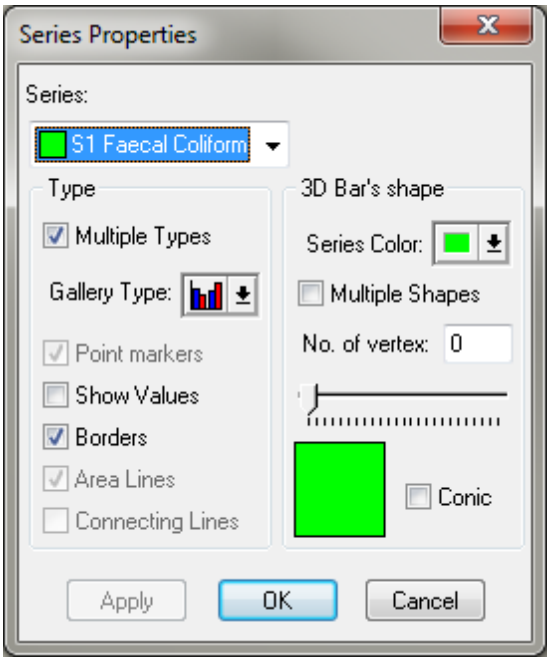
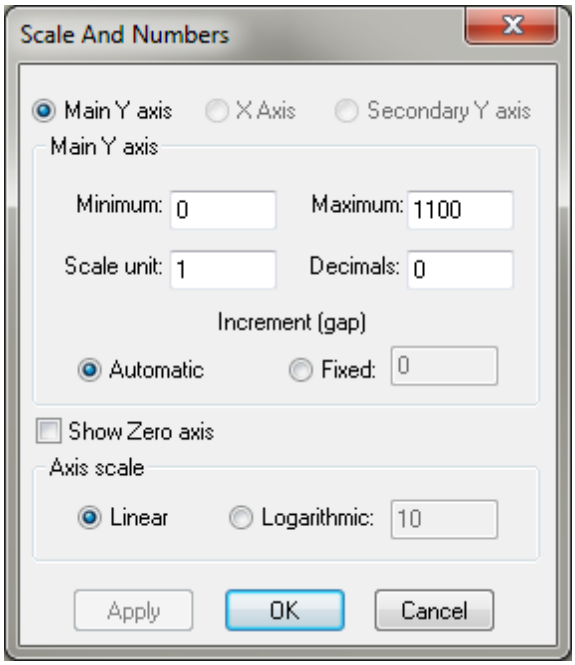


8.4.1.2.5.3 Scale Propeties

Scale Properties

Scale Properties include Linearity and Scaling options for the x and y-axis.



8.4.1.2.5.4 3D View Properties

3-D Properties

3-D Properties allow 2-Dimensional or 3-Dimensional Graphs, including full 3-D Rotation and

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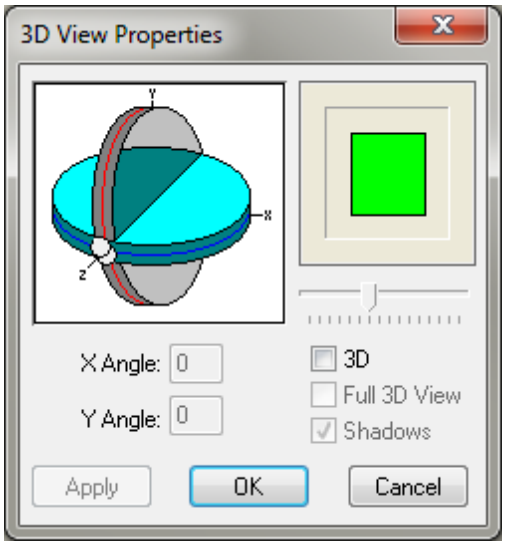
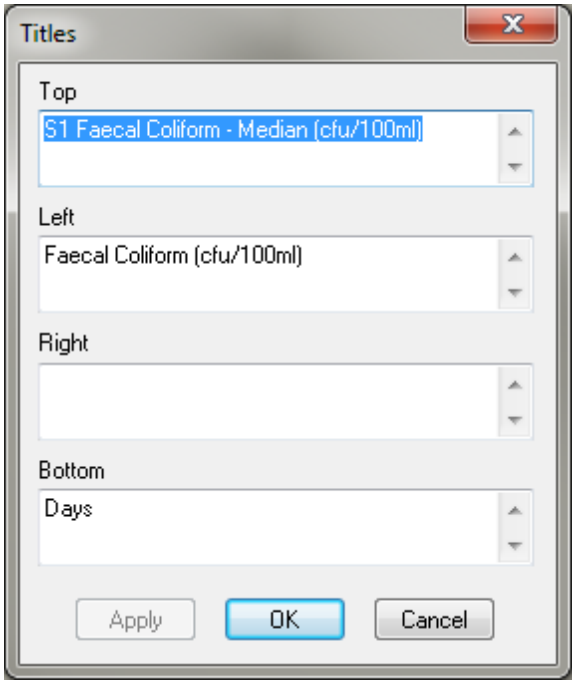
Shadows.



8.4.1.2.5.5 Titles

Titles

Title Properties include a Top, Bottom, Left, and/or Right Titles for the Graph.



8.4.1.2.6 Copy Options

Copy as Bitmap/Metafile/Data

Choosing one of the **Copy as ...** menu items copies the current Graph to the windows clipboard in one of the following formats:

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Select **Copy as Bitmap** to place a windows bitmap or DIB (Device Independent Bitmap) bitmap onto the windows clipboard. The bitmap will be the same size (number of pixels) as is shown on the screen. It will include stationary or fixed Legend Boxes, but not the Toolbar, Palette Bar, Pattern Bar, or floating Legend Boxes.

Select **Copy as MetaFile** to place a windows metafile onto the windows clipboard. The metafile will be resizable. It will include stationary or fixed Legend Boxes, but not the Toolbar, Palette Bar, Pattern Bar, or floating Legend Boxes.

Select **Copy as Data** to place the Data as ASCII text onto the windows clipboard. It will include the x-axis Legend as row labels, the Series (Location:Parameter) Legend as column headers, and the data will be separated by tabs.

Copy as Bitmap and **Copy as Data** may also be chosen by pressing the appropriate Toolbar button.

8.4.1.2.7 Automatic Scale

Automatic Scale

If the Automatic Scale menu item is checked, the application will automatically choose an appropriate scale for the data values.

8.4.1.2.8 Fonts

Fonts

Separate **Fonts** may be specified for several graph features, including Left, Right, Top and Bottom Titles, X and Y Legends, Legend Boxes, and Values. Fonts are chosen from a standard Windows Font Dialog Box.

Fonts may also be chosen by pressing the appropriate Toolbar button.

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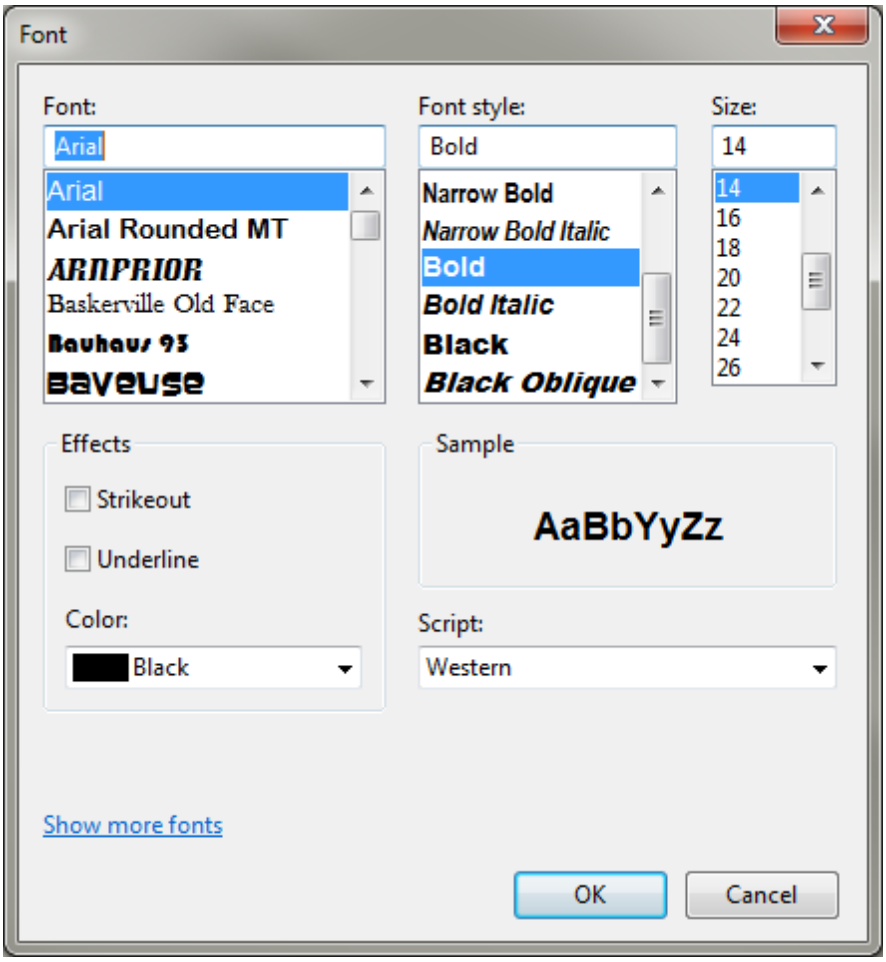
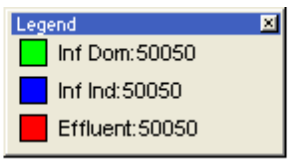


8.4.1.3 Legends menu

Legends menu

Legends identify Graphed Data values by specifying the Location:Parameter (and Formula), value, and/or Date (and Time) of the Data point. The **Legends** menu displays several on/off options. Use the Legends menu to turn on or off the following options:

- The **Series** or **Location:Parameter Legend Box** may be shown. The legend may be displayed in a Legend Box. **Series or x-axis Legend** text may be edited in the Data Window. If the Default Legend Text menu item is marked, legend text will be updated whenever the Graph is refreshed.



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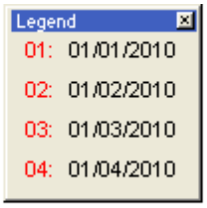
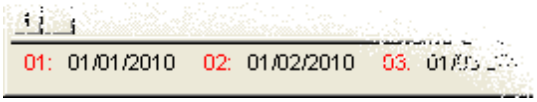
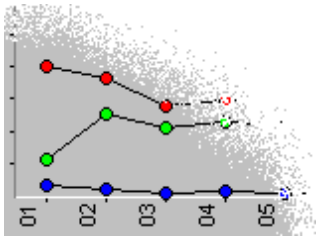
- The **x-axis Legend** is displayed from left to right at the bottom of the Graph. It is usually an abbreviated form of the Date (or Month, Year, or Time) for the associated Data. The full text legend may be displayed in an x-axis Legend Box.

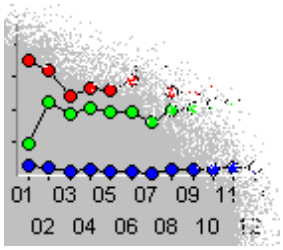




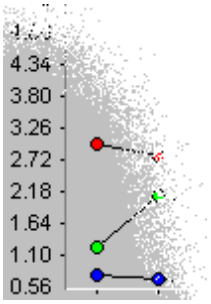
  - Use the **Vertical X Legend** option to rotate the text on the X Legend by 90 degrees.



  - Use the **Bi-Level X Legend** option to display the text on two lines, in an alternating fashion.



- The **y-axis Legend** is displayed from bottom to top at the left side of the Graph. It is a numeric Scale for the associated Data.



A **Secondary y-axis Legend** may be displayed from bottom to top at the right side of the Graph.

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A Legend Box may be moved as required. Right-click on any Legend Box and choose the Left, Right, Top, or Bottom menu item to attach it to the edge of the Graph window. Choose the Float menu item to make the Legend Box a floating (moveable by dragging with the mouse) and resizable window. If the Floating Legend Box is within the Graph window, choose the Fixed menu item to attach it (in place) to the Graph.

To change the appearance of a Legend Box, Right-click on any Legend Box and choose the Options menu item to select appearance options from a dialog box.

Legend Box Size

To **resize** a Left, Right, Top, or Bottom Legend Box, drag the Splitter Bar (available according to the Options settings). To resize a Floating or Fixed Legend Box, go to the **Legends** menu and choose the menu option **Series Legend Box Size**.

X Legend Gap

The X Legend Gap defines the display options for the X Legend as it appears on the graph. Several options are available, see the **X Legend Gap** topic for more information.

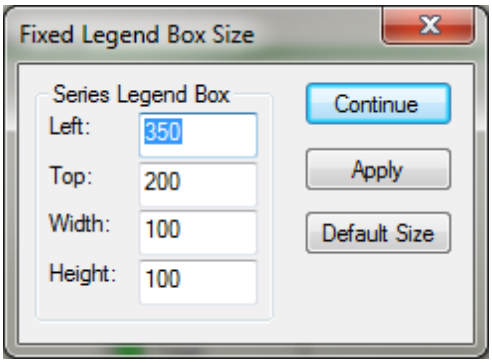
8.4.1.3.1 Legend Box Size

Series Legend Box Size

The Series Legend Box Size allows users to customize the dimensions and position of the series legend when floating or fixed on the graph. Go to the **Legends** menu and choose **Series Legend Box Size** to set the values for the legend.

Enter numeric values for **Left**, **Top**, **Width** and **Height**. Setting values for Top and Left will define where the box is positioned from the top and left edges of the graph and setting the width and height will define the size of the box.

Click **[Continue]** to apply the settings and see the changes. Click **[Apply]** to define the settings but leave the dialog open. Click **[Default Size]** to set the dimensions based on the legend text to be displayed.



8.4.1.3.2 X Legend Gap

X Legend Gap

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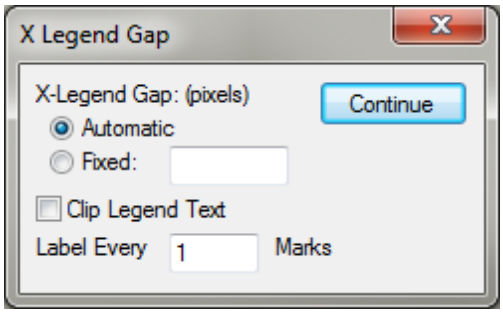
The X Legend Gap may be specified by using the **X Legend Gap Editor**. The X Legend Gap is the minimum distance between the x-axis marks (ticks). Choose the **( ) Fixed** radio button and enter a value in pixels (screen points). The **( ) Automatic** radio button allows the application to choose an appropriate value.

If the **[ ]Clip Legend Text** checkbox is marked, overlapping legend text will be clipped (cut) to an appropriate size.

To label the x-axis non-sequentially, enter a value for **Label Every ? Marks**. The first mark, and the first mark of each normal period for the data range type, is always labeled (i.e. the first of each month for daily data).

> ***NOTE:*** Entering a value for **Label Every ? Marks** that is greater than the number of normal periods in the data range type (i.e. greater than 31 for daily data), then the value for the normal period will be displayed. For example, daily data with a value greater than 31 will display the month label, instead of a day.



8.4.1.4 Window menu

Topics in this section include:

- Data Window
- Zoom
- Palette Bar
- Pattern Bar

8.4.1.4.1 Data Window

Data Window

Go to the **Window** menu and choose **Data Window** to displays the data in spreadsheet form instead of a graph.

It includes the x-axis Legend text as row labels, the Series (Location:Parameter) Legend text as column headers, and the data shown in each Data cell.

Legend text may be edited by LeftDoubleClicking the appropriate label. **Graphed Data values** may be edited by LeftDoubleClicking the appropriate Data cell.

> ***NOTE:*** Changing graphed Data values does **not** change the data in the underlying database. Use the Operator10 - Wastewater DataView application for permanently

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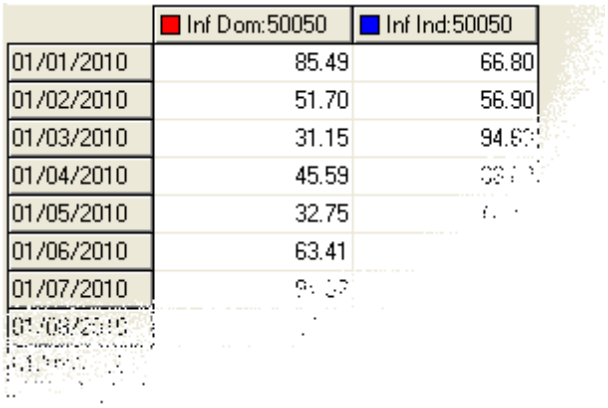
editing Data values.

NOTE: Data values will be updated whenever the Graph is refreshed. **Refresh will overwrite any changes** you have made to graphed Data.

NOTE: If the **Default Legend Text** menu item is marked, legend text will be updated whenever the Graph is refreshed. In that case, **Refresh will overwrite any changes** you have made to the legend text.



	Inf Dom:50050	Inf Ind:50050
01/01/2010	85.49	66.80
01/02/2010	51.70	56.90
01/03/2010	31.15	94.6
01/04/2010	45.59	
01/05/2010	32.75	
01/06/2010	63.41	
01/07/2010		

8.4.1.4.2 Zoom

Zoom/Resize Graph

To **Zoom in** or magnify any section of the current Graph, check the **Zoom** menu item, then LeftDrag through the area of the graph that should be shown in the window.

Uncheck the **Zoom** menu item to return to normal viewing.

Zoom may also be chosen by pressing the appropriate Toolbar button.

To **Resize a Graph** within its window, LeftDrag the edges (of the walls) of the graph as necessary. (The mouse cursor will change to arrows when moved directly over the edges of the graph.)

NOTE: The edges of a 3-D Graph are located at the edges of the inner walls, not the outer 3-D thickness of the walls. The edges of a 3-D Rotated Graph are located where the edges would be if not rotated.

Hint: If it is difficult to locate the edges of a 3-D Graph for resizing, return to 2-D mode, resize as desired, then restore 3-D mode.

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8.4.1.4.3 Palette Bar

Palette Bar

Go to the **Window** Menu and choose the **Palette Bar** option. Press the **Left or Right Arrows** to make the desired Color visible. **LeftDrag** it onto any part of the Graph to use that Color on that part of the Graph.

LeftDoubleClick any Color on the Palette Bar **to edit the Color**.

8.4.1.4.4 Pattern Bar

Pattern Bar

Go to the **Window** Menu and choose the **Palette Bar** option. Press the **Left or Right Arrows** to make the desired pattern visible. **LeftDrag** it onto any graphed data to use that pattern on the data.

LeftDoubleClick any Pattern on the Pattern Bar **to edit the pattern**.

8.4.1.5 Help menu

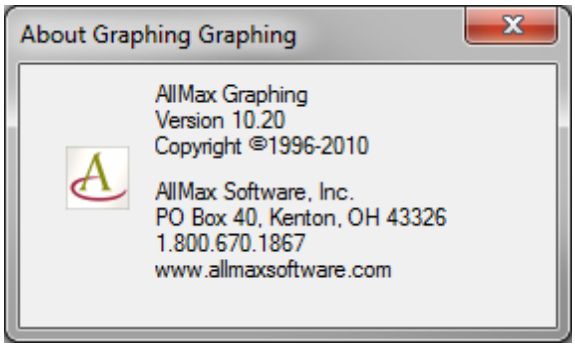
Topics in this section include:

- About

8.4.1.5.1 About

About

Go to the **Help** menu and select **About Operator10 - Wastewater.** The About dialog shows current information about the application including copyright and version numbers for OP10 software.



8.4.2 Toolbars

Topics in this section include:

- Main Toolbar

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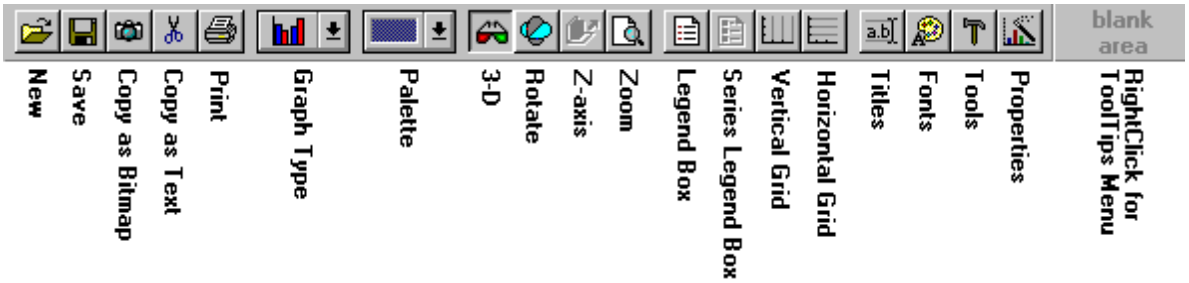
8.4.2.1 Main Toolbar

Toolbar

Most common menu items are available from the **Toolbar**.

Click on the graphic below for additional information:



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Part

9 Reporting

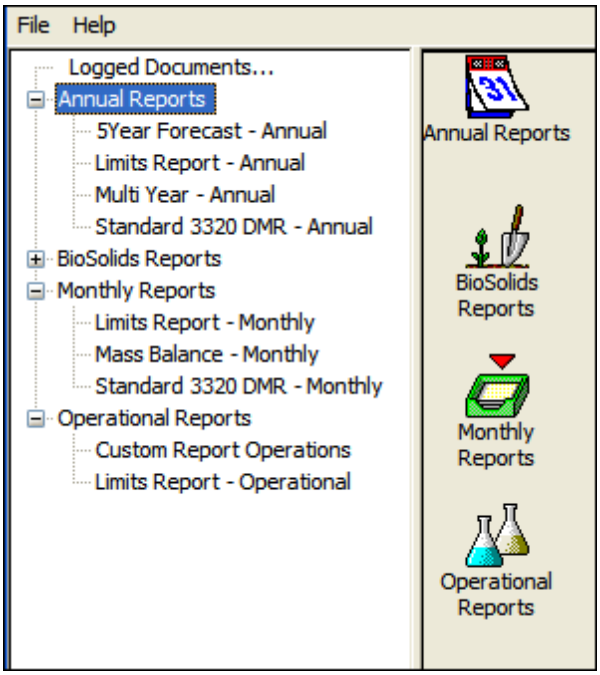
Operator10 - Wastewater Report section allows users to create comprehensive reports using stock report templates as well as full custom reports. Certain state-specific reports allow for the export of data using transformations that meet system requirements for import into state-based electronic reporting.

For more information see the following topics:

- Report Direct Access Tree
- Create Reports
- Report Properties
- Report Folder
- Report Preparation
- Report Types

9.1 Report Direct Access Tree

The **Report Direct Access Tree** pane lists the available Report Form Pages. Reports are categorized under **Report Folders**. Press the **[+]** button next to each folder to expand and view the available reports.



Report Preparation

Double-click the listed report to begin the print/preview process. (see: Print Report)

Double-click the listed Report Folders to begin the print/preview process for all listed reports of the selected folder. (see: Report Folder)

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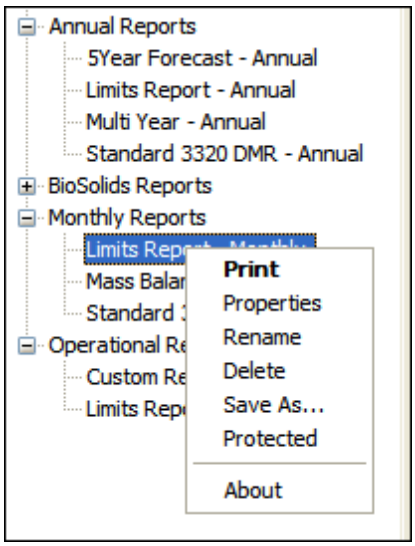
Right-click the listed report to view the available options:



Print

Select **Print** to begin the printing process. (see: Print Report)

Properties

To edit/view the properties of a selected report, select **Properties** (see: Report Properties)

Rename

If the selected report should be renamed, select **Rename** from the menu and enter a new report name in the Rename window that appears. Press the **[Save]** button to rename the report.

Delete

To remove a report from this section, select **Delete** from the menu. Confirm the deletion by pressing the **[Yes]** or **[No]** button.

Save As...

Select **Save As...** to create an exact copy of the selected report, with a new name. Enter the name into the Save As window that appears and click the **[Save]** button to save the report.

Protected

To make a report read-only, select **Protected** from the menu. A check should appear the next time a right-click is made on the selected report. Changes can be made to the report properties, but when exiting the properties section the user will be prompted to save the report with a new name.

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About

To view the settings of the selected report, select **About...**

9.2 Report Picklist

PickList

The **Report PickList** is a dialog box displaying a list of reports that the user may choose to print.

- To **choose an item**, highlight the item in the PickList and press **[Select]**, or **DoubleClick** on the item.
- To **filter the list** and only display items which match filter criteria, enter a filter (0 to 255 characters) in the box and press [!]. See the Operator10® main application help for details on filtering.
- Enter the **Report Date and Print Date** by pressing the **[...]** buttons or entering a date.

9.3 Create Reports

Topics in this section include:

- Add Report
- New Report Availability
- Report Name

9.3.1 Add Report

Unlimited report pages can be added to the Operator10 - Wastewater Report section.

Add a New Report

To Add a Report, right-click in the **Direct Access Report Tree** (left pane) and select **New Report...**

In the **New Reports** window (below) place a check in the appropriate checkbox beside the report you wish to create.

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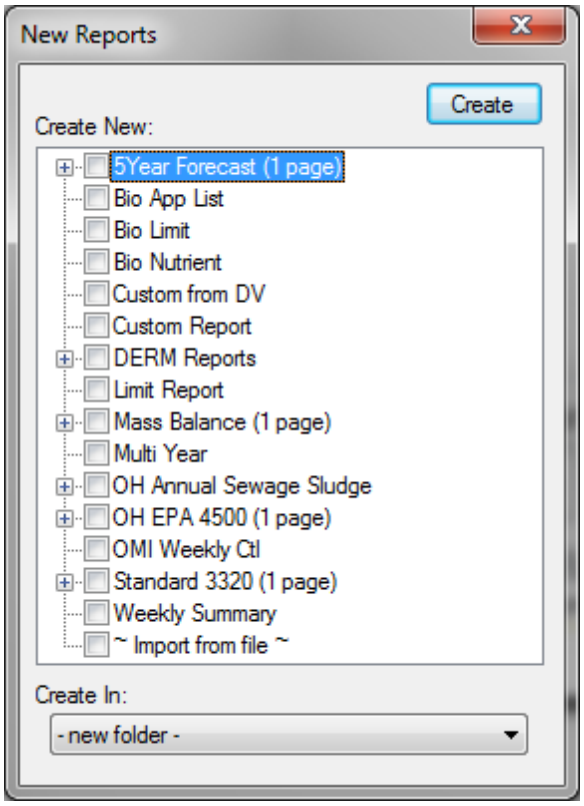
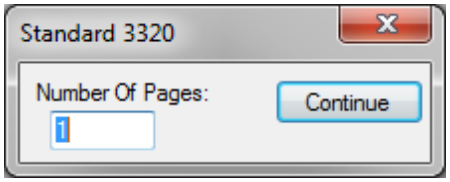


Multiple Pages

If you wish to create multiple pages of a multipage report, press the [+] button beside the report, and enter in the number of pages you wish to create. (below)



Report Folder

To create the selected reports in a selected Report Folder, choose from the drop-down list box Create In:. If -new folder- is selected, you will be prompted to create a new folder name with a selected icon for shortcut use in the Operator10 - Wastewater Report section. (below)

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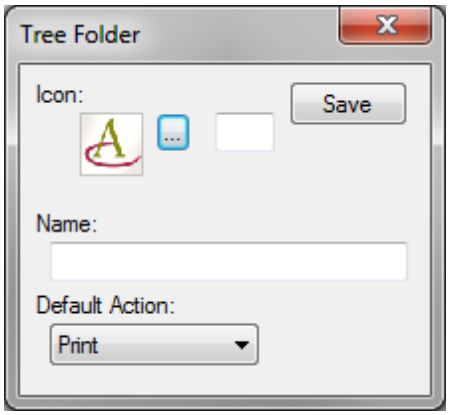


9.3.2 New Report Availability

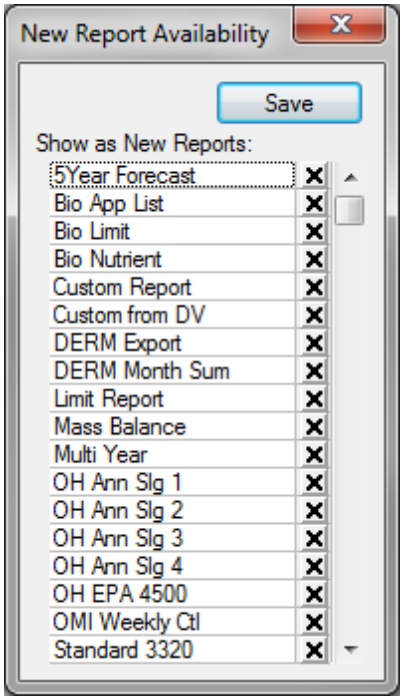
Reports available in the **New Report...** selection window can be limited. To add to or reduce the number of available reports to users, go to the **File** menu and select **New Report Availability** from the menu.

Remove Report Availability

To remove a report from the **New Reports...** selection window, click the **[X]** button beside the selected report. Repeat as necessary and click the **[Save]** button to save the changes.

Add to Report Availability

To add a report to the **New Reports...** selection window, click the **[ ]** space beside the selected report. Repeat as necessary and click the **[Save]** button to save the changes.



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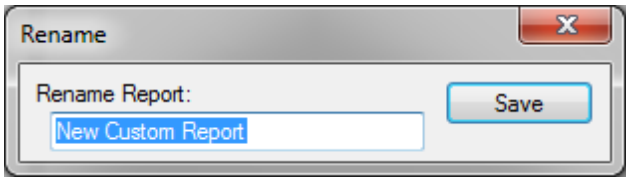
9.3.3 Report Name

Report Name

Reports can be named uniquely in order to identify the report and purpose of the report. In the Rename dialog, enter the report name in the **Rename Report** field. Press the **[Save]** button to commit the change.



9.4 Report Properties

Report Properties

Once a report has been created, user must edit the report and define it's **properties** so that data may be output.

Right-click a selected report and select **Properties** from the Right-click menu. A new window titled **Report Properties** will open.

Report properties and options vary by report, consult this help file and look for the report style for specific information about it's properties. See the Report Types topic for more information.

General Help:

The Report Properties window is divided into two panes. In the left pane, there is a reduced image representing the selected report style. Areas in the image have been enabled so that a Left-click will bring up the corresponding fields and options in the right pane.

Edit the available fields in the right pane as necessary.

In the left pane:

- Press the **[Save]** button to save the current setup.
- Press the **[Preview]** button to preview the current setup. See Report Print Preview for more information.
- Press the **[Guidance]** button to view additional information regarding the selected report style. See Report Guidance Documents for more information.

NOTE: Use the **<Page Up>** and **<Page Down>** buttons on your keyboard to navigate through the mapped sections in the left pane.

NOTE: Use the **scroll bar** at the bottom of the **Report Properties** window to navigate to other reports in the **Report Folder**.

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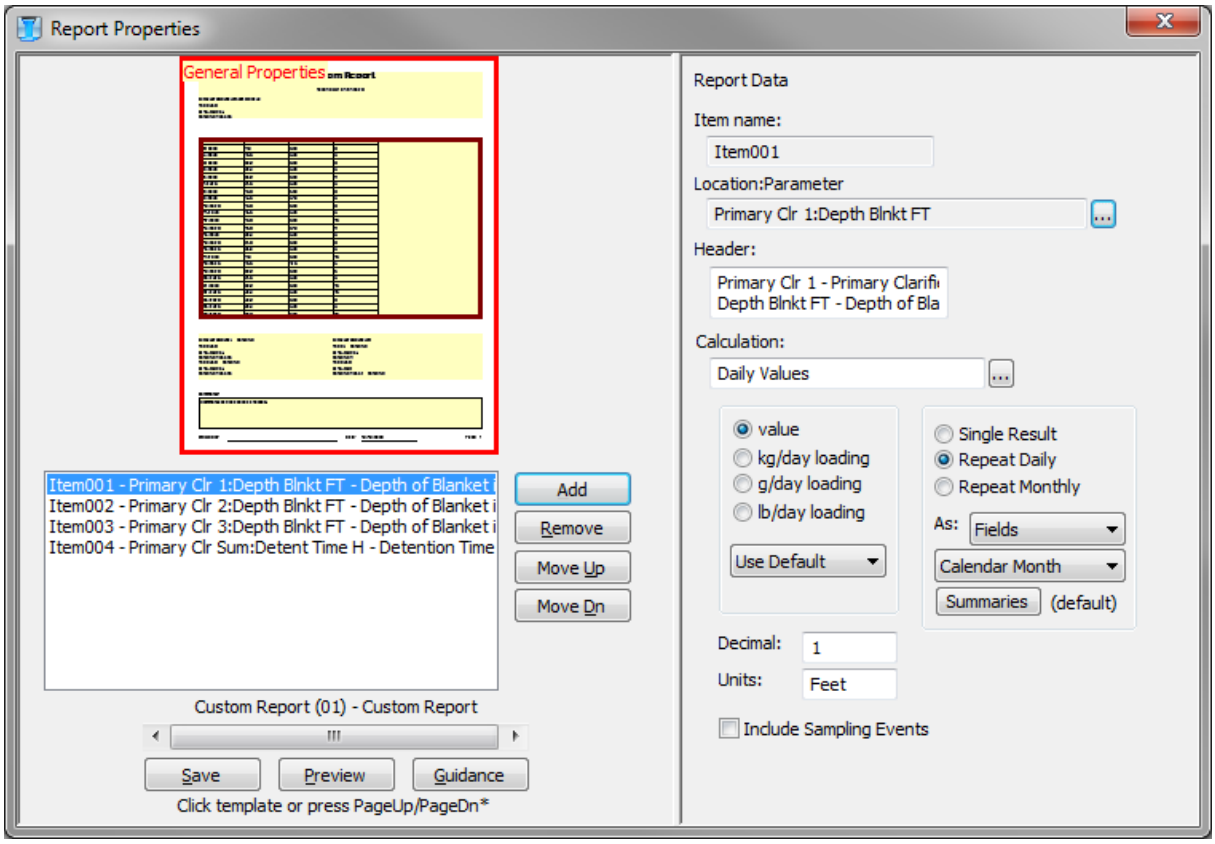

9.4.1 Report Calculations

In select reports, users may choose from a list of stock formulas and user-written formulas for use during reporting.

Highlight the calculation or formula and press **[Select]**.

Maximum, **minimum**, **average**, and **sum** formulas calculate based on daily or hourly values for the selected reporting period.

Lower limit options for **Average (Lower Limit)**, **Average (Hourly Lower Limit)**, and **Avg % Removal (Lower Limit)** have been provided for reporting requirements that specify a lower limit. Example: lower limit of 85 for percent removal.

Weekly average formulas are designed to meet state reporting requirements and determine when the 7-day period begins. Averages are calculated for each week in the selected reporting period and a summary value is returned based on the selected weekly formula: minimum, average or maximum.

Continuous - Overlapping 7-day averages begin on the first day of the reporting period.

First of Month - 7-day averages begin on the first day of the reporting period.

Sat Rule - Weekly average (Sun-Sat) when the Saturday is in the reporting period.

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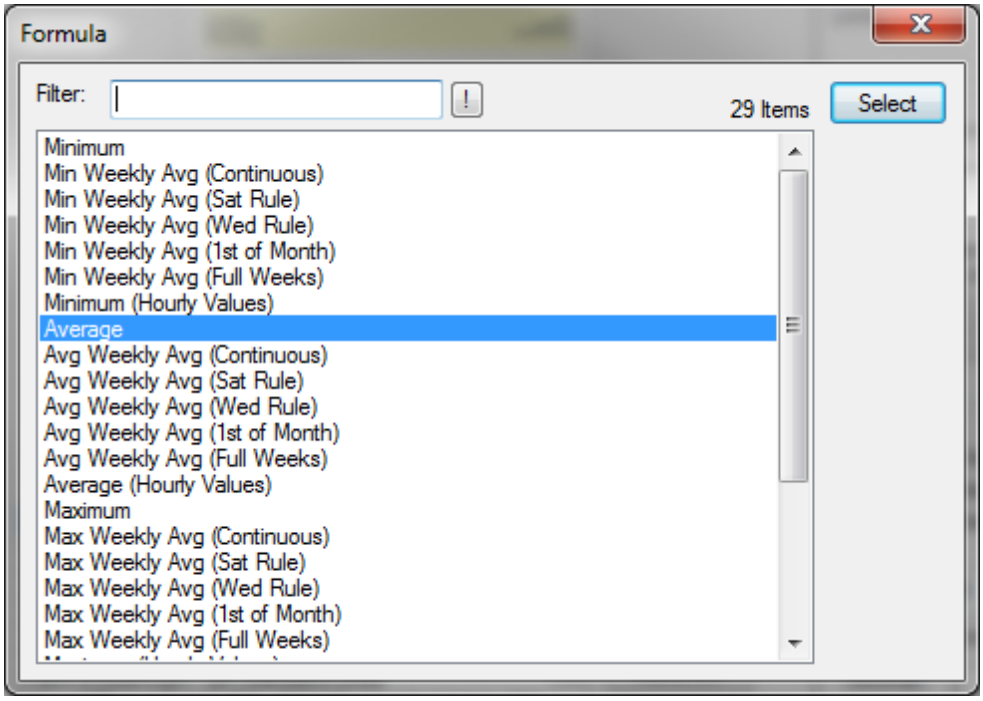
Wed Rule - Weekly average (Sun-Sat) when the Wednesday is in the reporting period.

Full Weeks - Weekly average (Sun-Sat) only when all 7 days are in the reporting period.

NOTE: average calculations for fecal parameters use a **geometric mean** (logarithmic mean).



9.4.2 List and Label Report Designer

Operator10 - Wastewater® uses an integrated 3rd party report generator known as **List & Label**. This report generator includes a fully featured designer capable of creating incredibly robust reports that make use of data stored in the Operator10 - Wastewater database. Access to the List & Label template designer is given in both the Barcode Label and Reporting sections of Operator10 - Wastewater.

Getting Help

The **List & Label** report template designer comes with its own user's manual, and that manual can be accessed through the Operator10 - Wastewater main menu under: **Help | Manuals | Report Designer**. Assistance is also available by contacting the AllMax technical support department.

Additionally, users in the Designer window can click on the ? menu and select Contents to view the List & Label Report Designer Help.

NOTE: This help file page is only meant to serve as a primer for the **List & Label Designer**. Please consult the combit List & Label Help file for detailed information or

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contact AllMax Software Technical Support for more help.

Creating Reports

When creating Custom Reports, press the **[Edit Template]** button to open the **Designer** window and begin editing the report template.

NOTE: The Designer window will open and there may be several panes visible, this help file will be concentrating on the Layout Preview area and the List of variables pane.

To modify a report template, you can drag variables into the Layout Preview pane. In the **List of variables** pane, there is a tree displaying the available variables for the template.

Expand the folders by pressing the **[+]** button next to each folder. In each folder there are available variables. The folders labeled **Itemxxx** correspond to the selected Location:Parameters.

For single values, under the **Variables** folder, find the **Itemxxx** folder and expand it, within that folder you may see:

- **Calc** (Calculation)
- **Header** (Header)
- **Locat** (Location)
- **Param** (Parameter)
- **Result** (Numeric Result)
- **Units** (Units)

For repeating values, under the **Fields** folder, find the **Itemxxx** folder and expand it, within that folder you may see:

- **Date** (Date)
- **Result** (Numeric Result)

Modifying Objects

Once an object has been placed on the report, you can modify it's appearance by double-clicking on it to view the **Properties** window.

Several appearance options are visible in the right pane of the **Properties** window. Click in the appropriate appearance option to modify it.

To add information to be displayed in the selected object, press the button and a new window **Edit Text** will open. In the **Edit Text** window, add the information to be

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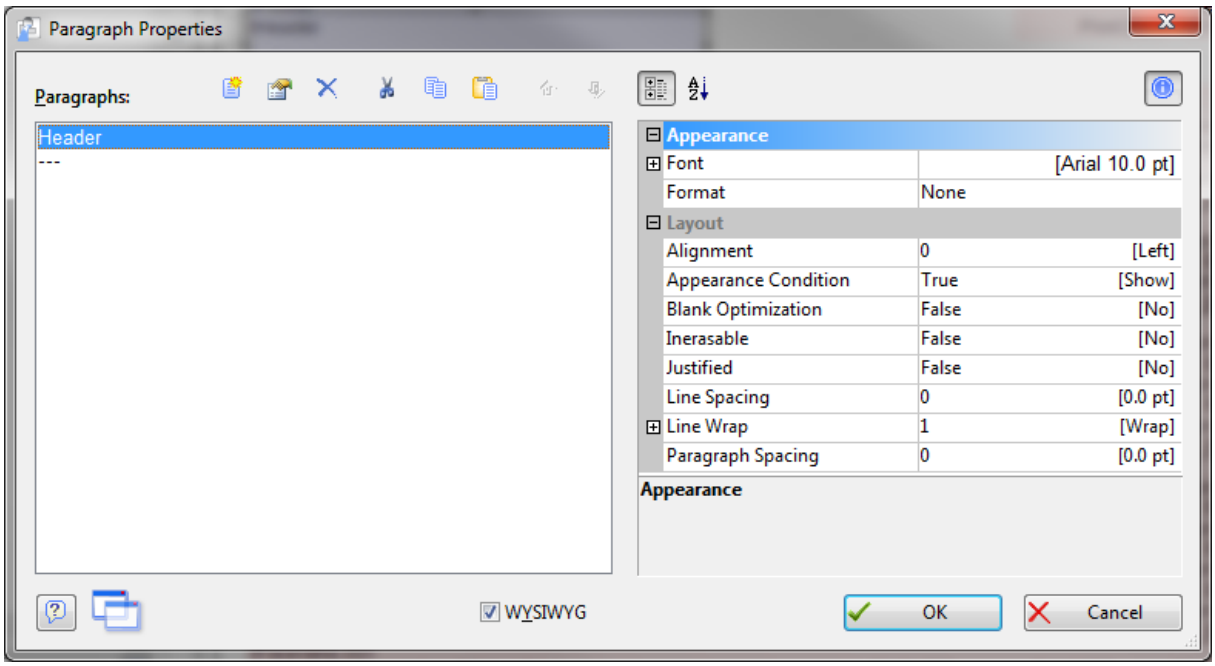
displayed. A status message will appear below the entered text alerting users whether the data can and/or will be displayed as entered.



Available Objects

On the left side of the Designer window, a toolbar displays the list of available objects to be added to the report.

Select

Text

Line

Rectangle

Ellipse/Circle

Picture

Barcode

Table

Formatted Text

Form Control

Chart

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Crosstab (Pivot Table)

HTML Text

OLE Container

9.4.3 Report Guidance Documents

Report Guidance Documents

Report Guidance Documents are available for every report provided by AllMax Software, Inc. This allows users to view specific details regarding the stock reports, state forms and custom reports to be created from the Operator10 - Wastewater.

To access the **Guidance Document** for a report, press the **[Guidance]** button and a new window will be visible.

Guidance documents may be printed for future use.

9.5 Report Folder

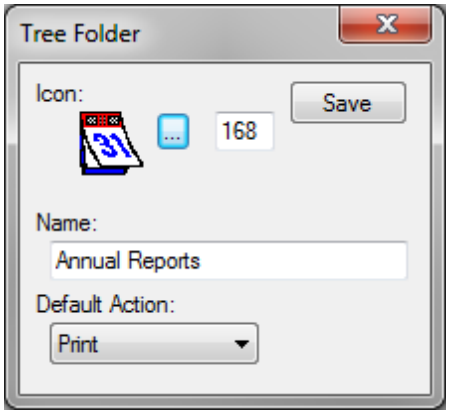
Report Folders contain links to existing **Report Pages** and serve as a grouping tool.

Add Report Folder

To Add a Report Folder, right-click in the Direct Access Report Tree (left pane) and select **New Folder**...

In the Tree Folder window enter a **Name:** (1-30 characters) to identify the report folder. You may select an icon by pressing the **[...]** button and selecting from the drop-down list box or entering a number in the field to the right.

Select a **Default Action:** frosm the drop-down menu. Choices include **Print** and **Export**.



Add Reports to Report Folders

New Reports
New reports can be added to any folder, right-click on the desired folder and choose

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New Report... from the right-click menu to begin. Continue the process using the Add Report help topic.

Existing Reports
Existing reports can be moved to existing folders as needed. In the Report Direct Access Tree, click the **[+]** button to expand any folders in which reports are currently stored. With the list of report pages expanded, press and hold the left mouse button. With the left mouse button held, drag the report to the other report folder where the report should be located. Release the left mouse button. A menu should appear, choose from the 3 available options:

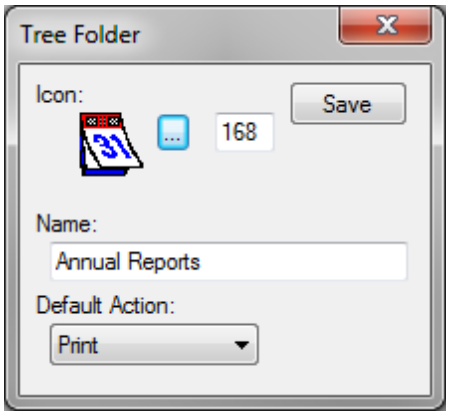
- **Add to folder** - this option will add a reference to the report page to the selected folder, the report will "exist" in two or more folders as defined.
- **Move to folder** - this option will move the existing report page from the previous folder to the selected folder.
- **Save As...** - this option will allow the user to save a copy of the report page with a new name in the selected folder.

9.5.1 Report Folder Icons

Icons provide shortcuts to Reports-- Double-Click on an icon to Print/Preview the associated Reports.

Choose an icon bitmap from the available pictures by typing in the number of the icon or by using the **[...]** button.
Enter a **Name** (1 to 30 characters) which will be displayed below the icon.

NOTE: Icon spacing and font are dependent on Windows icon settings.



9.6 Report Preparation

Topics in this section include:

- Print Report
- Print Preview
- Report Date
- Calendar
- Logged Documents

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9.6.1 Print Report

Print Report Pages

In the **Report Direct Access Tree**, highlight the **Report Folder** or **Reports** you wish to print.

In the right pane of the Report application, double-click the **Report Folder Icon** you wish to print.

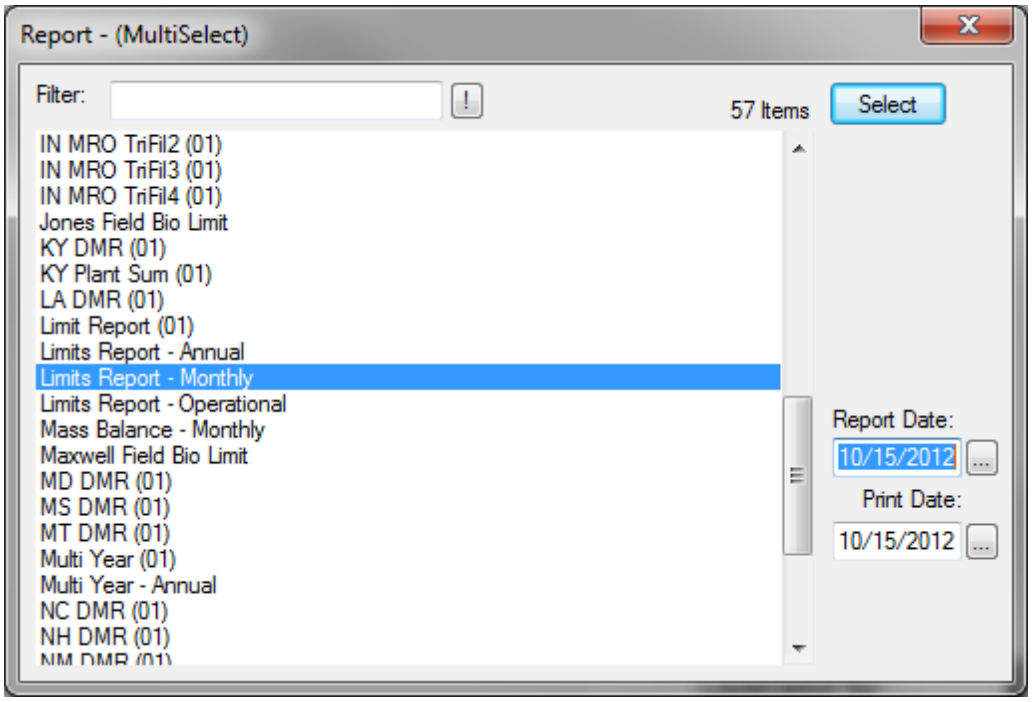
The **Report (MultiSelect)** picklist will be visible, from the picklist, choose from the list of reports to be printed. If you have selected a Report Folder to print, all pages listed under the Report Folder will be highlighted.

Enter a **Report Date:** and **Print Date:** then press the **[Select]** button to begin the print process.

A window, **Output Options** (below) will open, press the **[Change...]** button choose the printer.

Select the output method by choosing from the **Direct to...** drop-down list box. Many options are available, view the list for available options.

Press **[Start]** to begin the process.



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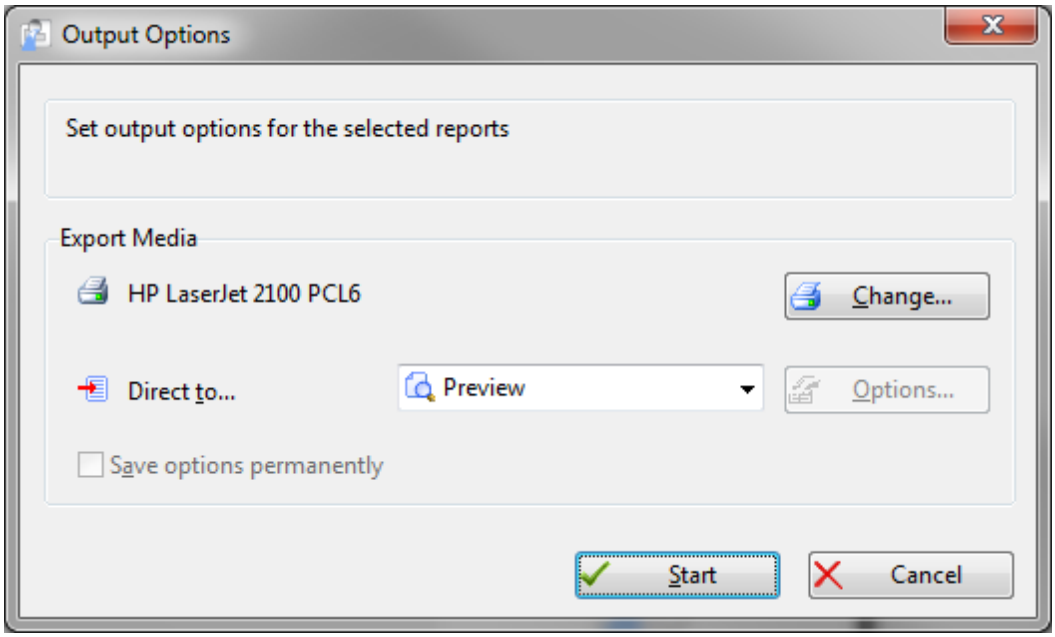


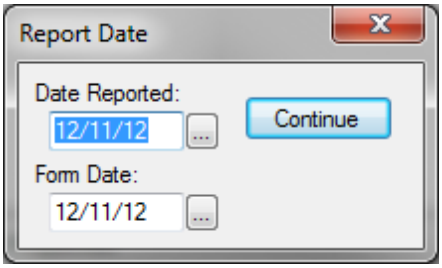
9.6.2 Print Date

Print Date/Report Date

Enter the **Date Reported:** or select the date from the calendar by pressing the **[...]** button. The Date Reported is the date on which the report will begin processing and displaying data. Typically, entering the first of the month to be reported will provide the necessary information for the report to begin printing.

Enter the **Form Date:** or select the date from the calendar by pressing the **[...]** button. The Form Date is the date on which the report is being printed or prepared.

Press **[Continue]** to prepare the report.



9.6.3 Print Preview

Print Preview shows a screen representation of printer output prior to actual printing. In the **Preview** window, there are two panes, in the left pane a reduced image representing the report page to be printed is visible, left-click the desired report page to make it visible in the right pane. In the right pane of the **Preview** window, the report is visible. The shaded area around the outside of the report represents the unprintable area of the selected printer.

From left to right in the **Preview** window, use the following toolbar options to preview

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your reports.

- Use the **<**, **>**, **|<** and **>|** buttons to navigate through the selected previews, or select from the drop-down list box showing the number of pages available
- **Zoom In or Out** using the **%** drop-down list box, magnifying glasses or the **1:1** buttons
- To **print** the current page, press
- To **print all** pages, press
- To **save** the report, press

  NOTE: List and Label report previews can be saved in a variety of formats, in the Save dialog window, use the drop-down list box Save as type: to select from available formats.

- To **email** the report, press
- To **exit** the preview, press

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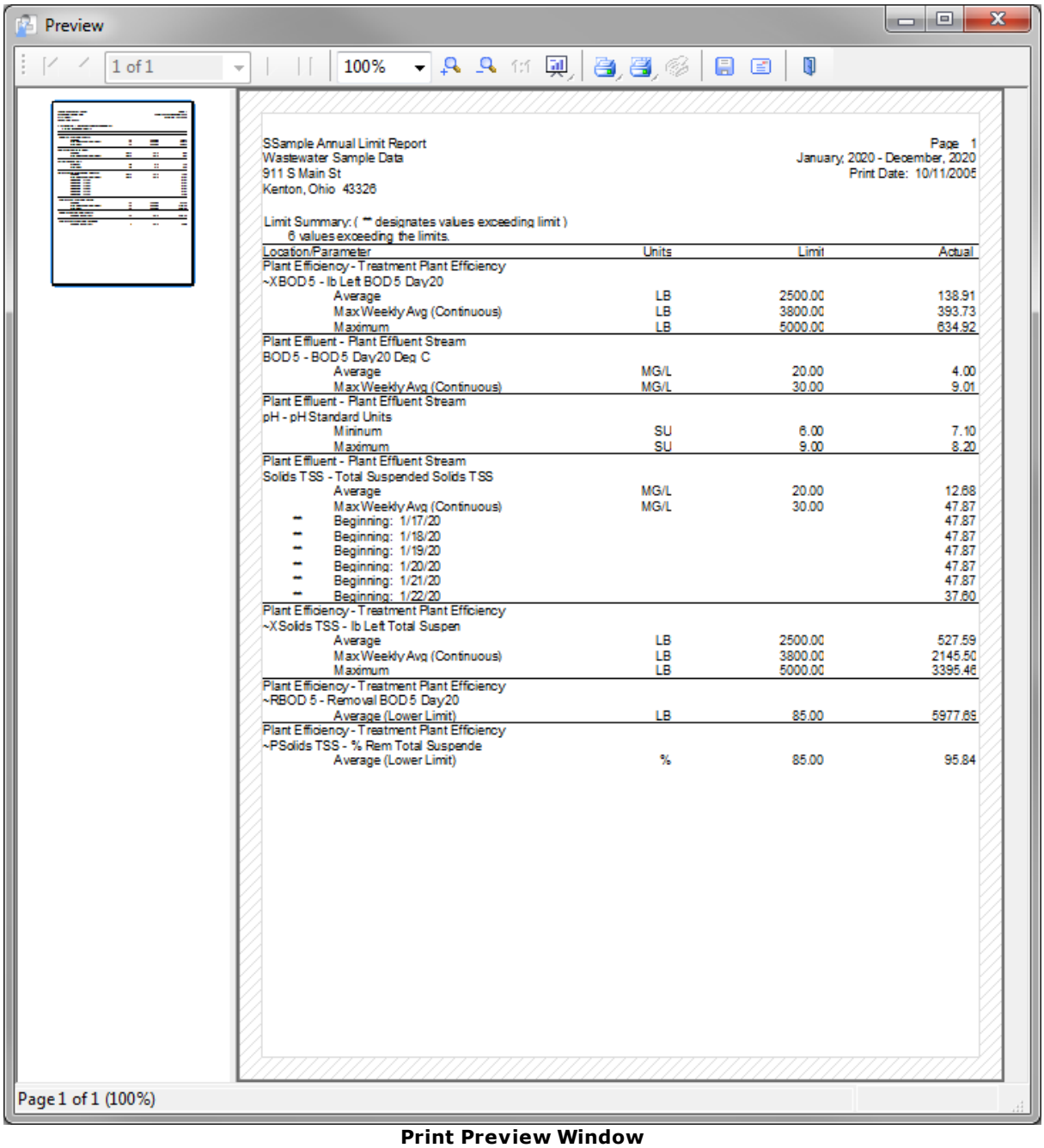
Preview
1 of 1
100%
SSample Annual Limit Report
Wastewater Sample Data
911 S Main St
Kenton, Ohio 43326
Page 1
January, 2020 - December, 2020
Print Date: 10/11/2005
Limit Summary: (** designates values exceeding limit)
6 values exceeding the limits.
Location/Parameter Units Limit Actual
Plant Efficiency - Treatment Plant Efficiency
~XBOD 5 - lb Left BOD 5 Day20
Average LB 2500.00 138.91
Max Weekly Avg (Continuous) LB 3800.00 393.73
Maximum LB 5000.00 634.92
Plant Effluent - Plant Effluent Stream
BOD 5 - BOD 5 Day20 Deg C
Average MG/L 20.00 4.00
Max Weekly Avg (Continuous) MG/L 30.00 9.01
Plant Effluent - Plant Effluent Stream
pH - pH Standard Units
Minimum SU 6.00 7.10
Maximum SU 9.00 8.20
Plant Effluent - Plant Effluent Stream
Solids TSS - Total Suspended Solids TSS
Average MG/L 20.00 12.68
Max Weekly Avg (Continuous) MG/L 30.00 47.87
** Beginning: 1/17/20 47.87
** Beginning: 1/18/20 47.87
** Beginning: 1/19/20 47.87
** Beginning: 1/20/20 47.87
** Beginning: 1/21/20 47.87
** Beginning: 1/22/20 37.60
Plant Efficiency - Treatment Plant Efficiency
~XSolids TSS - lb Left Total Suspen
Average LB 2500.00 527.59
Max Weekly Avg (Continuous) LB 3800.00 2145.50
Maximum LB 5000.00 3395.46
Plant Efficiency - Treatment Plant Efficiency
~RBOD 5 - Removal BOD 5 Day20
Average (Lower Limit) LB 85.00 5977.69
Plant Efficiency - Treatment Plant Efficiency
~PSolids TSS - % Rem Total Suspende
Average (Lower Limit) % 85.00 95.84
Page 1 of 1 (100%)

Print Preview Window

9.6.4 Report Date

Reports are usually printed for a particular date (**Report Date:**), and are printed on a particular day (**Print Date:**). A form may be printed for any Date Reported, and the form may be printed with any Form Date.

For information on entering dates, see the **Date/Calendar** section.

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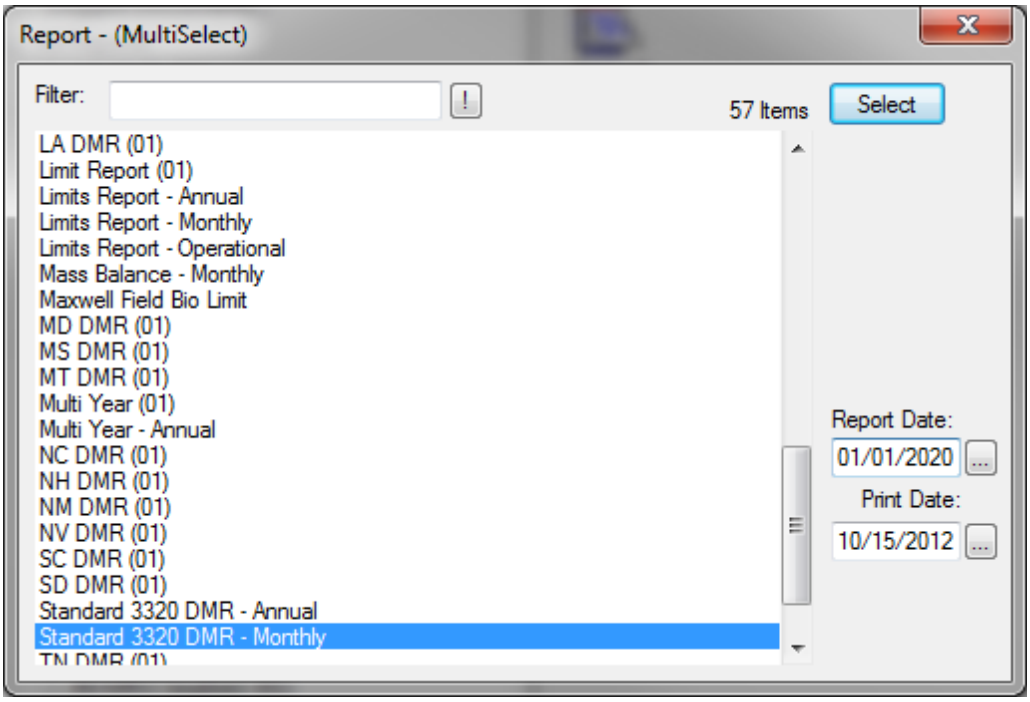
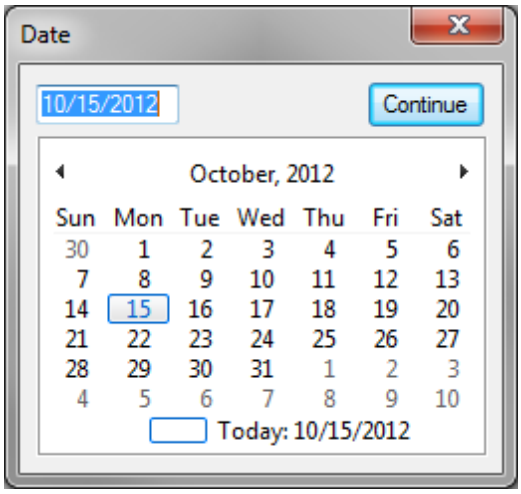


9.6.5 Calendar

The **Date** may usually be selected from the **Calendar** dialog box by pressing the **[...]** popup button next to the Date. Use the **[<]** and **[>]** buttons to select the previous or next month, then press the appropriate **[1 to 31]** day button to enter the date.

With a date selected, click the **[Continue]** button.



9.6.6 Logged Documents

The **Logged Documents** feature is available in the Main Application, as well as in DataView, Graphing and Reporting. The Logged Documents option allows users to save or "log" any and all printed documents, including graphs, DataViews, and Reports.

To access logged documents in the Reporting Application, click on the **File** menu and

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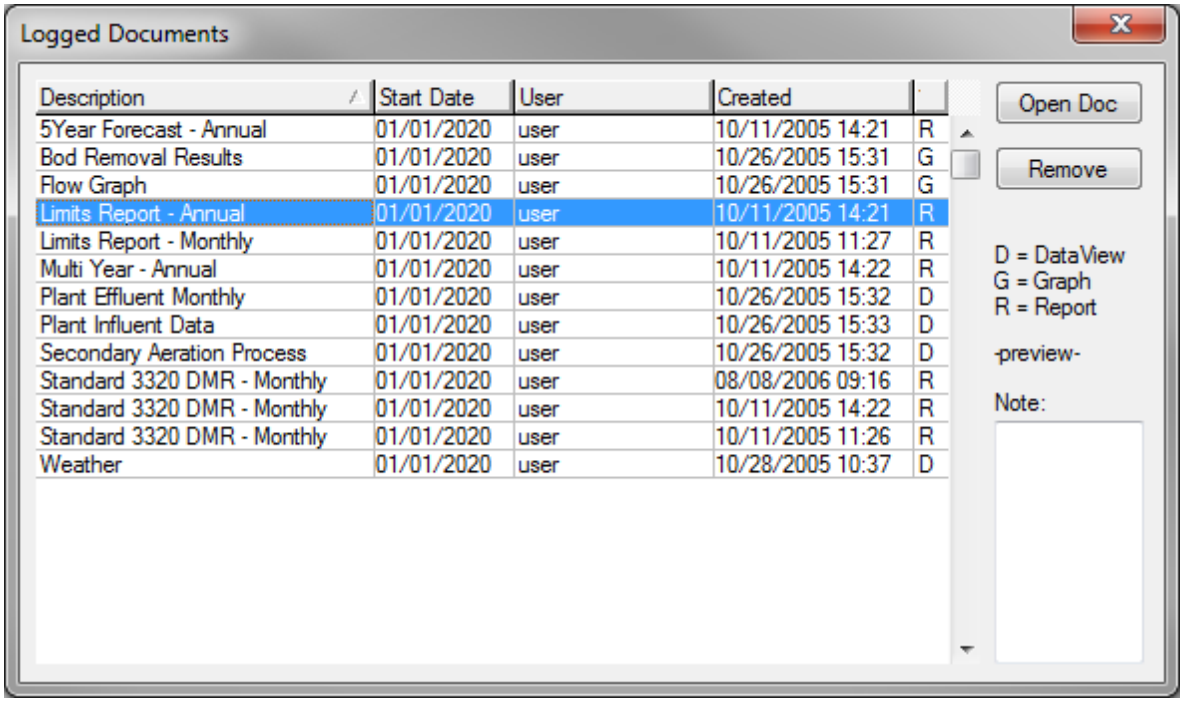
select **Logged Documents**.

In Reporting, the Logged Documents list is automatically filtered to include only those documents created in the Reporting section. Place a check the **[]Include All** box to see the logged documents for all sections.

In the Logged Documents window, information for each document is displayed in the grid, including description, date of the first document (useful if the item is actually a group of reports, or if the data spans a wide time frame), user who logged the document, the date of document logging, and type of document. For each item in the Logged Documents list, a note may be entered in the box provided. Notes may be modified at any time. Click the **[Open Doc]** button to preview the document, or **[Remove]** to permanently delete the logged document.

Notes may be saved for each logged document as well, enter any notes into the field labeled, **Note:**.


Logged Documents
Description
Start Date
User
Created
5Year Forecast - Annual 01/01/2020 user 10/11/2005 14:21 R
Bod Removal Results 01/01/2020 user 10/26/2005 15:31 G
Flow Graph 01/01/2020 user 10/26/2005 15:31 G
Limits Report - Annual 01/01/2020 user 10/11/2005 14:21 R
Limits Report - Monthly 01/01/2020 user 10/11/2005 11:27 R
Multi Year - Annual 01/01/2020 user 10/11/2005 14:22 R
Plant Effluent Monthly 01/01/2020 user 10/26/2005 15:32 D
Plant Influent Data 01/01/2020 user 10/26/2005 15:33 D
Secondary Aeration Process 01/01/2020 user 10/26/2005 15:32 D
Standard 3320 DMR - Monthly 01/01/2020 user 08/08/2006 09:16 R
Standard 3320 DMR - Monthly 01/01/2020 user 10/11/2005 14:22 R
Standard 3320 DMR - Monthly 01/01/2020 user 10/11/2005 11:26 R
Weather 01/01/2020 user 10/28/2005 10:37 D
Open Doc
Remove
D = DataView
G = Graph
R = Report
-preview-
Note:

9.6.7 Report Verify

Report Verify

Remarks/Comments

Enter **remarks** or **comments** to be printed on the Report Form Page. If you wish to always be prompted for remarks, mark the **[]Allow Comments** checkbox in the Report Properties dialog box.

Remarks are preserved for the next time of printing.

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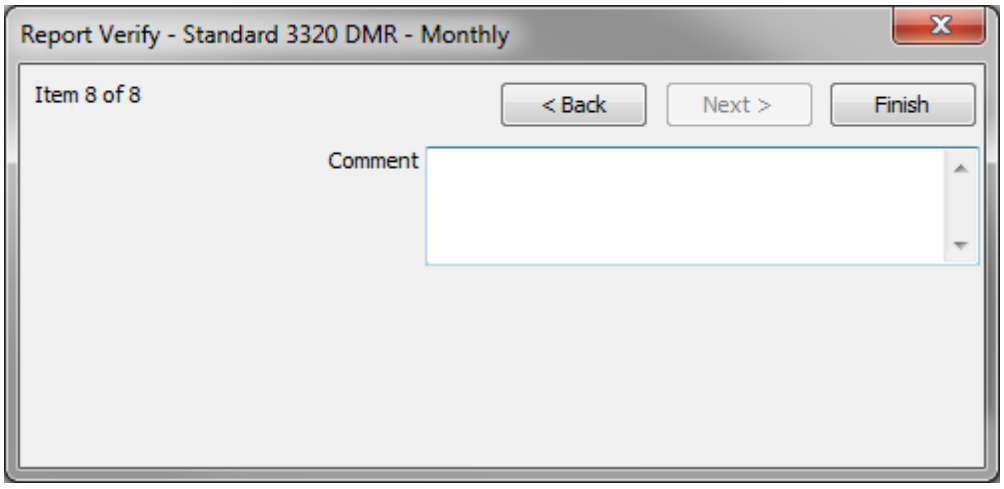
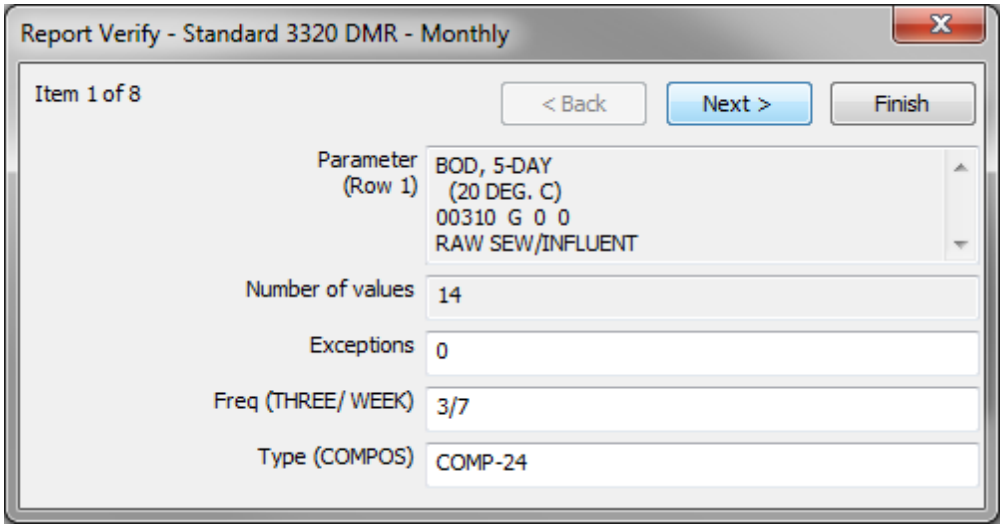


Exceptions/Sample

Enter or edit the **Number of Exceptions**, **Frequency of Analysis**, and **Sample Type** for the Parameter shown to be printed on the Report Form Page. If you wish to be prompted for Exceptions, mark the **[]Verify Exceptions** checkbox in the Report Properties window, General Properties section.



9.7 Report Types

Many stock report styles or types are provided within Operator10 - Wastewater.

See the following topics for more information:

- Custom Reports
- Annual Summary Reports
- Mass Balance Reports
- Limit Report

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- Weekly Summary Report
- Federal DMR Report
- BioSolids Reports
- Pretreatment Reports (not available in Operator10 Wastewater and Water Data Management Applications)

9.7.1 Custom Reports

Topics in this section include:

- Custom Report (Full Custom)
- Custom Report (From DataView)
- Custom Report Setup

9.7.1.1 Custom Report (Full)

Custom Reports can be created in Operator10 - Wastewater® Software using the Custom Report Style. There are several options available for custom reports, single data values, daily tables, monthly tables, and graphs can be added to a custom report. The custom report is created by adding parameters, choosing calculation and data types, then editing a template in the List and Label Report Designer.

There are 5 sections in which the Custom Report can be defined in addition to the template:

- General Properties
- General Information
- Report Data
- User Input
- Comments

9.7.1.2 Custom Report (From DV)

Custom Report from DV can be created in Operator10 - Wastewater® Software using the Custom Report Style. There are several options available for custom reports, single data values, daily tables, monthly tables, and graphs can be added to a custom report. The custom report is created by adding parameters, choosing calculation and data types, then editing a template in the List and Label Report Designer.

To create a Custom Report from DV, choose the **Custom from DV** report style when choosing the new report. Once you click **[Create]** you will be asked to select a **DataView** from the DataView picklist. Highlight the DataView to be used in the creation of your custom report and press **[Select]**. A confirmation dialog window will appear asking about orientation, answer **[Yes]** or **[No]** appropriately. Once created a new Custom Report will be visible. Location:Parameters will already be selected based on the chosen DataView.

There are 5 sections in which the Custom Report can be defined in addition to the template:

- General Properties

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- General Information
- Report Data
- User Input
- Comments

9.7.1.3 Custom Report Setup

Topics in this section include:

- General Properties
- General Information
- Report Data
- User Input
- Comments

9.7.1.3.1 General Properties

In the **General Properties** setup section for the Custom Report, users can edit the following fields:

Page Adjustment and Print settings:

Size (%):
Enter a percentage to which you would like to reduce the printed form.

X Offset:
Adjust the X coordinate to which you would like to offset the printed form.

Y Offset:
Adjust the Y coordinate to which you would like to offset the printed form.

Range:
Select the range (in months) that the report should cover. Choose the range from the dropdown list box.

Choose **Custom** from the drop-down and enter a number of days in the **Custom Days:** field

Sampling Events Fields:
Press the **[...]** button to view a list of available fields from the Sampling Events section of Operator10 - Wastewater Software. Individually select the fields from the list, when selected a check will appear by each field, press **Continue** to add those fields to the report.

[Edit Template]
Press the **[Edit Template]** button to open the List and Label Report Designer window.

Treat <>~ Data As:
Select from the drop-down menu to determine the method by which data with the less-than (<), greater-than (>) or non-detect (~) data qualifiers will be treated.

Available options are:

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- **Preserve Types:** Calculations will preserve the available data qualifiers and calculated results will display the appropriate data qualifier.

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = <3 as the less-than symbol to be preserved for the final calculation

- **Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using only the numeric entered portion of the data

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = 3 as the less than symbol will be dropped for the final calculation

- **Half Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using one-half the entered value of the data

  Example: results = 3, 6, <2, 1; average = (3+6+1+1)/4 = 2.75 as the less than symbol is dropped and 2 is divided in half for final calculation

- **Zero:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using zero (0) in place of any entered data

  Example: results = 3, 6, <2, 1; average = (3+6+0+1)/4 = 2.5 as the less than symbol is dropped and 0 is used in place of <2 for the final calculation

- **Blank (no data):** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers treating data entered with qualifiers to be seen as blank.

  Example: results = 3, 6, <2, 1; average = (3+6+1)/3 = 3.333 as the less than symbol is dropped and no data is used in place of <2 in the final calculation

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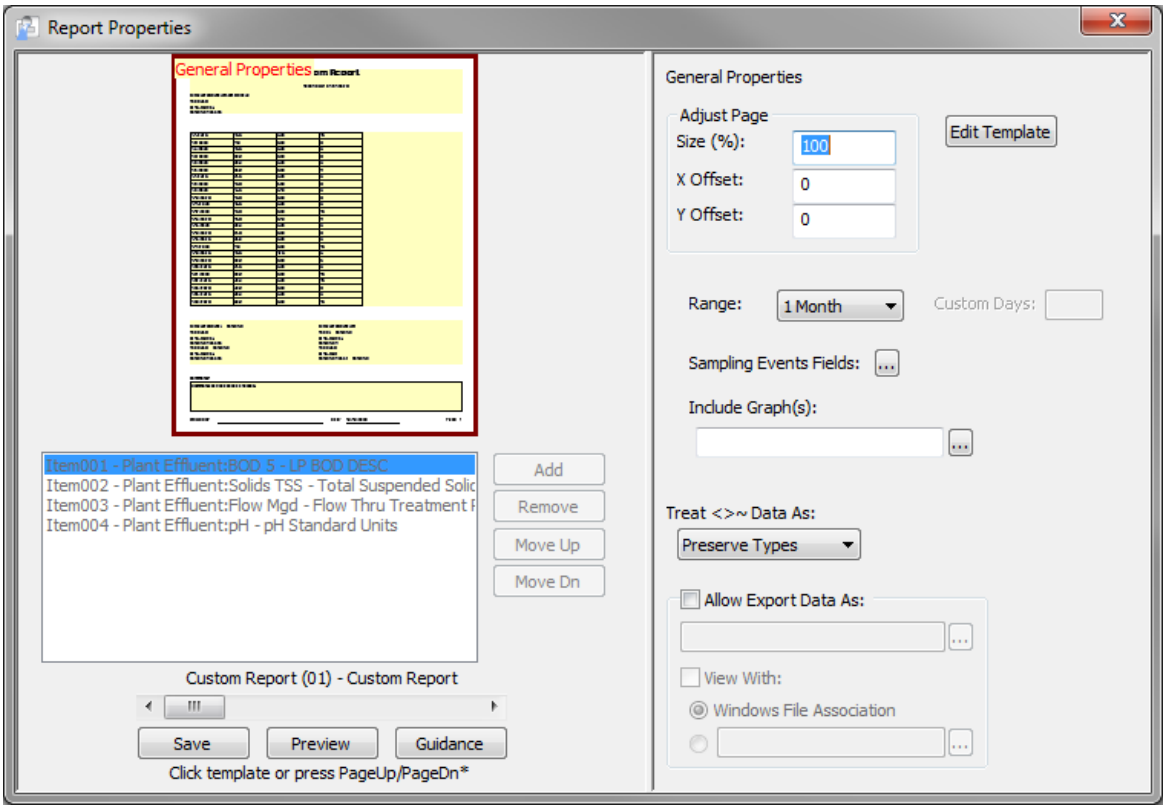

9.7.1.3.2 General Information

In the General Information setup section for the Custom Report, users can edit the following fields:

General Information Data:

Report Name:
Enter a name for the report.

Facility:
Enter a facility name for the Limit Report. The default facility name will initially be filled in, modify this as necessary.

Report Header:
Enter up to 3 (three) lines of text to be used as a header for the report.

Beginning Page #
Enter the beginning page #. The Custom Report will continue to number subsequent pages if applicable. Leave this field blank to use default numbering.

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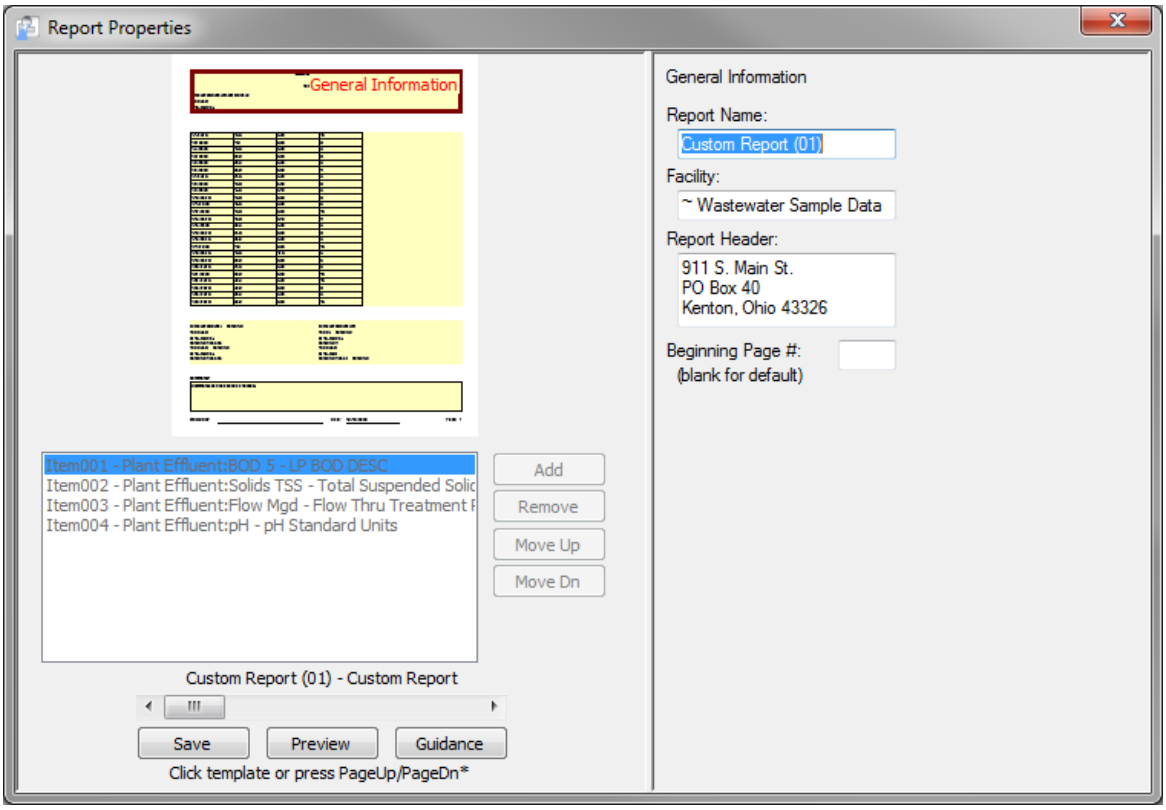

9.7.1.3.3 Report Data

In the Report Data setup section for the Custom Report users can define the following pieces of information.

Items:

To add Items (**Location:Parameters**) to be displayed on the Custom Report, press the **[Add]** button on the left pane of the window. Select a Location:Parameter from the picklist that appears. Highlight the desired Location:Parameter and press the **[Select]** button.

Each Location:Parameter added will be given an Item name (beginning with Item001) this Item name will be the identifier when editing the Template in the List and Label Report Designer.

Item Data

Location:Parameter:
To change a selected Location:Parameter, press the **[...]** button to select a Location:Parameter to be reported on the Custom Report. Find the Location:Parameter in the Location:Parameter Picklist that appears and press the **[Select]** button.

> ***NOTE:*** The Location value is available for display on a custom report, add **Itemxxx.Locat** to view.

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> ***NOTE:*** The Parameter value is available for display on a custom report, add **Itemxxx.Param** to view.

Header:
To modify the header of the selected Location:Parameter, modify this field. Two lines of text may be entered.

> ***NOTE:*** This field is available for display on a custom report, add **Itemxxx.Header** to view.

Calculation:
Press the **[...]** button to display a picklist of available calculations for the selected Location:Parameter. To review the list of available calculations, consult the Calculations help file page. Daily values is the default selection and will display the single daily value is chosen. Additionally, custom formulas will also be available at the bottom of the picklist. Consult the Main help file for Formula help.

> ***NOTE:*** This field is available for display on a custom report, add **Itemxxx.Calc** to view.

To show the entered data or to calculate a loading value select from:

- **( ) value**
- **( ) kg/day loading**
- **( ) g/day loading**
- **( ) lb/day loading**

To define how the data should be shown on the report, choose from:

- **( ) Single Result**; will show daily data as single value, non-repeating
- **( ) Repeat Daily**; will repeat the selected daily data value for the defined report period, choose this to display daily data in a table
- **( ) Repeat Monthly**; will calculate a monthly value for the selected report period, choose this to display monthly data in a table
- **As:** - The As: field will change as you select from the listed options above it, however, there are other options available:
  - **Variables** (Displays single value, non-repeating, best when used with Single Result)
  - **Fields** (Displays repeating values, best when used with Repeat Daily)
  - **Transposed Fields** (Displays repeating values, but the X and Y axis are reversed, allowing for a result similar to the Daily or Weekly DataViews)
  - **Chart Data** (Readies data to be available for List and Label's Report Chart Object)

Decimal:
Indicate the desired number of decimal precision to be shown on the report.

Units:
Enter the Units to be reported for a selected Item. The default units of the selected Location:Parameter will be shown, modify as necessary.

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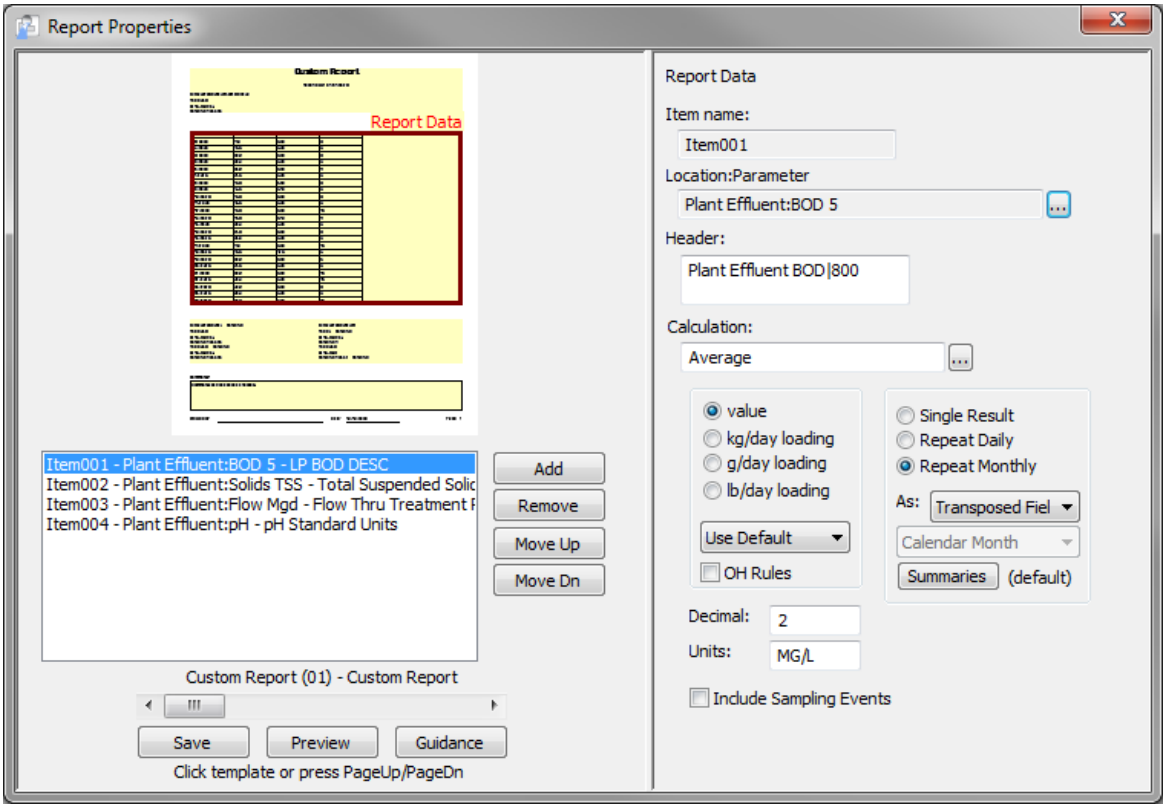
NOTE: This field is available for display on a custom report, add **Itemxxx.Units** to view.

[ ] Include Sampling Events
Place a check in the Include Sampling Events checkbox to include the selected Sampling Event fields from the General Properties setup section.



9.7.1.3.4 User Input

User Input can be created and entered at the time of printing, to provide a more dynamic report. Data setup in the User Input section is passed through to the List and Label Template Designer and is available for usage on the printed report.

User Input Setup

In the User Input section, users can define up to 10 groups of user input entries. Each group of user input options provides 6 items that can be defined.

User Input Groups

To Navigate to each Group of User Input items, click the **[Next >]** or **[< Back]** buttons

Each group of user input options can be verified at the time of printing. Place a check in the **[ ] Verify** checkbox to receive the prompt when printing and enter information at that time.

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User Input Item Definition

Label:
Enter text into the Label field to help define the User Input item

Type:
Items can be defined as follows:

- Text - provides a single-line text entry field
- Multi-line Text - provides a multi-line text entry field
- Password - provides a text-masked entry field
- Checkbox - provides a true/false checkbox
- Grid - provides a customizable grid for table-based entry

Default
Enter text into the **Default:** field to be used each time the report is printed.

Read Only
Each item can be flagged as read only, preventing changes from being made at the time of printing.

Report Usage

User Input items are passed through with the following syntax to the Report Template as data:

- UserX.ItemY.Label - Passes through the information defined in the field **Label:**
- UserX.ItemY.Text - Passes through the information defined in the field **Default:** or what is entered at the time of printing
- UserX.ItemY.Text.Z - Passes through field information based on entered data in the **Grid**, when selected

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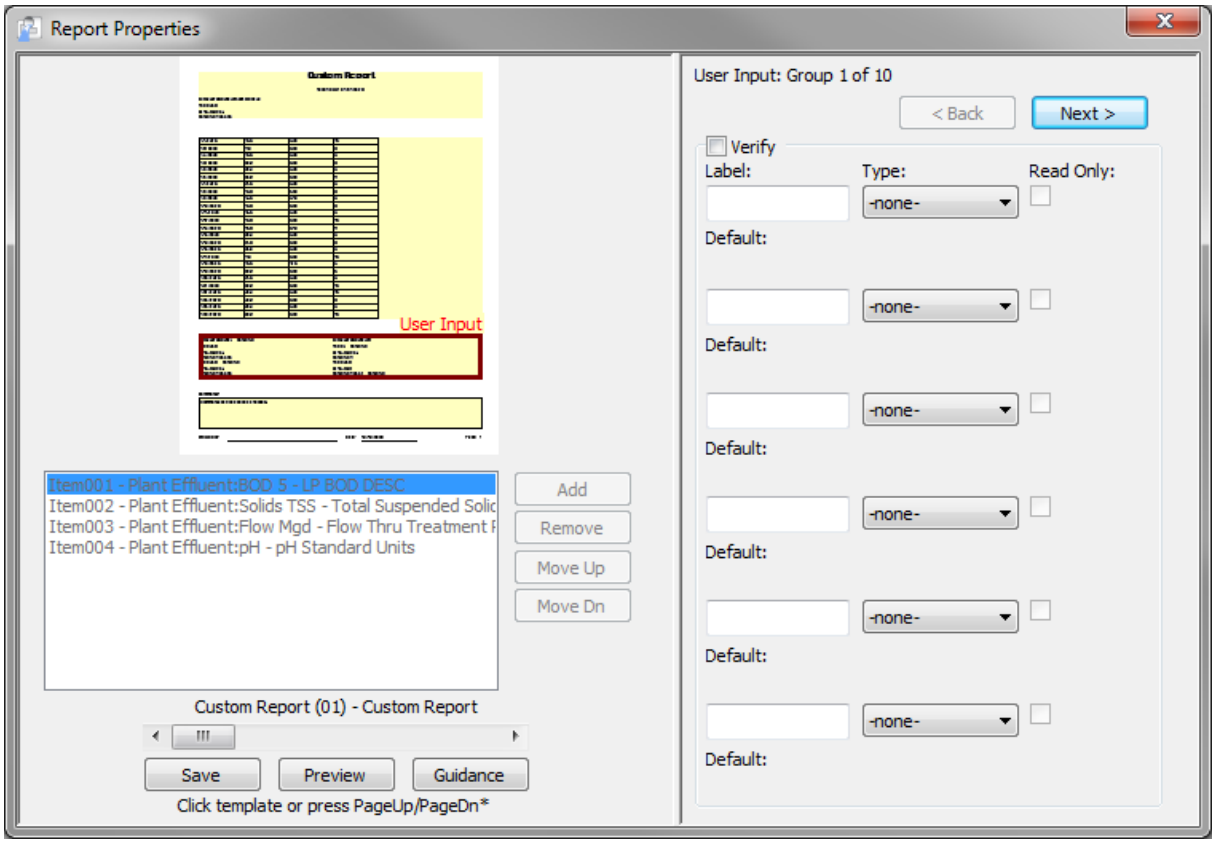

9.7.1.3.5 Comments

In the Comments setup section for the Custom Report, users can edit the following information:

Comments

Enter the default comments to appear on report at the time of printing. Users can modify these comments at the time of printing if the **[ ] Verify Comments:** checkbox is marked.

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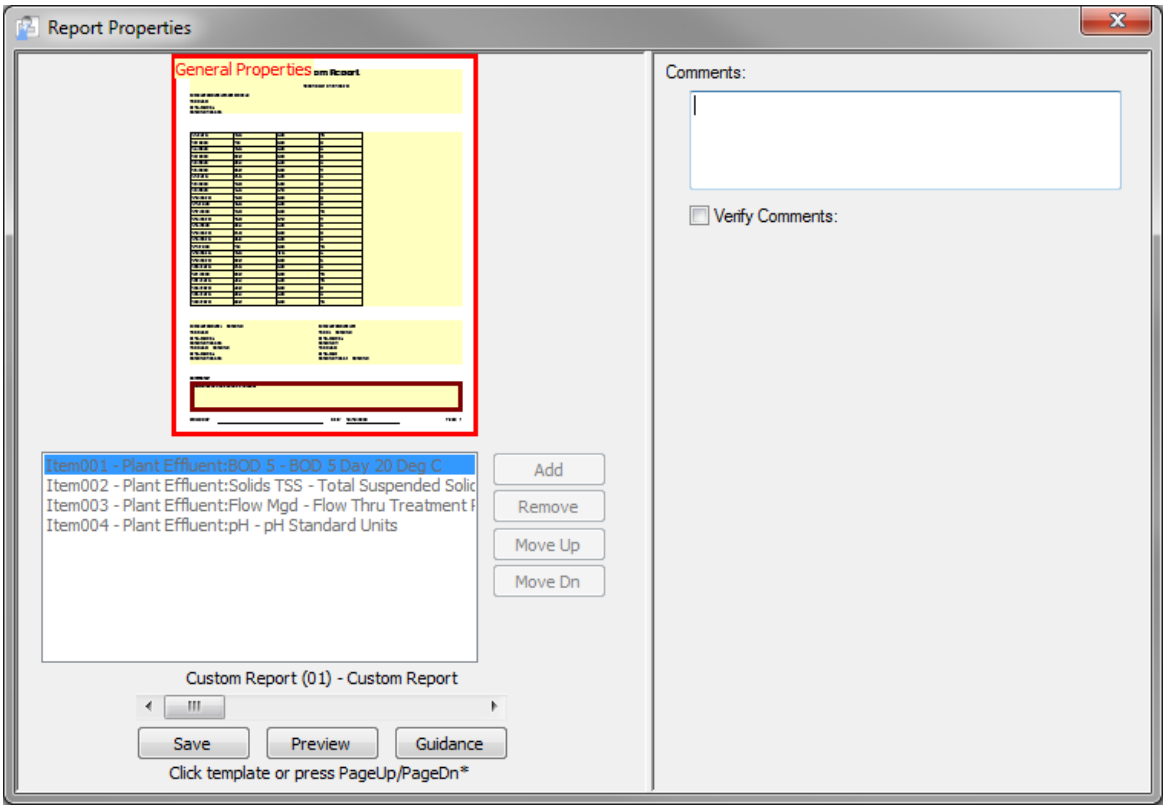

9.7.2 Annual Summary Reports

Topics in this section include:

- 5 Year Forecast Report
- Multi-Year Summary Report

9.7.2.1 5 Year Forecast Report

The **5-Year Forecast Report** provides a projection for the next 5 years based on data from the previous 5 years. The form is consistent with methods for **Pennsylvania Chapter 94** reports.

Setup options include:

- General Properties and Information
- Parameter and Calculation Settings
- Additional Parameter
- PE/EDU and Industry Projections
- Comments

9.7.2.1.1 5 Year Forecast Setup

Topics in the section include:

- General Properties and Information

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- Parameter and Calculation Settings
- Additional Parameter
- PE/EDU and Industry Projections
- Comments

9.7.2.1.1.1 General Properties

In the **General Properties and Information** setup section for the 5-Year Forecast Report, users can edit the following fields:

Page Adjustments and Print Settings:

Size (%):
Enter a percentage to which you would like to reduce the printed form.

X Offset:
Adjust the X coordinate to which you would like to offset the printed form.

Y Offset:
Adjust the Y coordinate to which you would like to offset the printed form.

()Plain Paper
Mark the **()Plain Paper** radio button to print the entire form, including all lines, headers, and data.

()Form
Mark the **()Form** radio button if you are printing directly on, or will be copying onto a blank form.

Preprinted Form
If generic information is already preprinted on the form, mark the **()Preprinted Form** radio button to print only the data and appropriate information.

[]Allow Remarks:
To enter comments at the time of printing, check the **[]Allow Remarks** checkbox.

[]Include Graph
A graph representing the reported data and projections can be included if the **[] Include Graph** checkbox is marked.

Page #
Enter a page number of total pages into these fields.

Report Title
To customize the title of this report enter it into this field.

Facility
To customize the name of the facility on this report, enter it into this field. The field will be set to the default facility name coming from the name of your current facility.

Treat <>~ Data As:
Select from the drop-down menu to determine the method by which data with the

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less-than (<), greater-than (>) or non-detect (~) data qualifiers will be treated.

Available options are:

- **Preserve Types:** Calculations will preserve the available data qualifiers and calculated results will display the appropriate data qualifier.

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = <3 as the less-than symbol to be preserved for the final calculation

- **Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using only the numeric entered portion of the data

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = 3 as the less than symbol will be dropped for the final calculation

- **Half Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using one-half the entered value of the data

  Example: results = 3, 6, <2, 1; average = (3+6+1+1)/4 = 2.75 as the less than symbol is dropped and 2 is divided in half for final calculation

- **Zero:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using zero (0) in place of any entered data

  Example: results = 3, 6, <2, 1; average = (3+6+0+1)/4 = 2.5 as the less than symbol is dropped and 0 is used in place of <2 for the final calculation

- **Blank (no data):** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers treating data entered with qualifiers to be seen as blank.

  Example: results = 3, 6, <2, 1; average = (3+6+1)/3 = 3.333 as the less than symbol is dropped and no data is used in place of <2 in the final calculation

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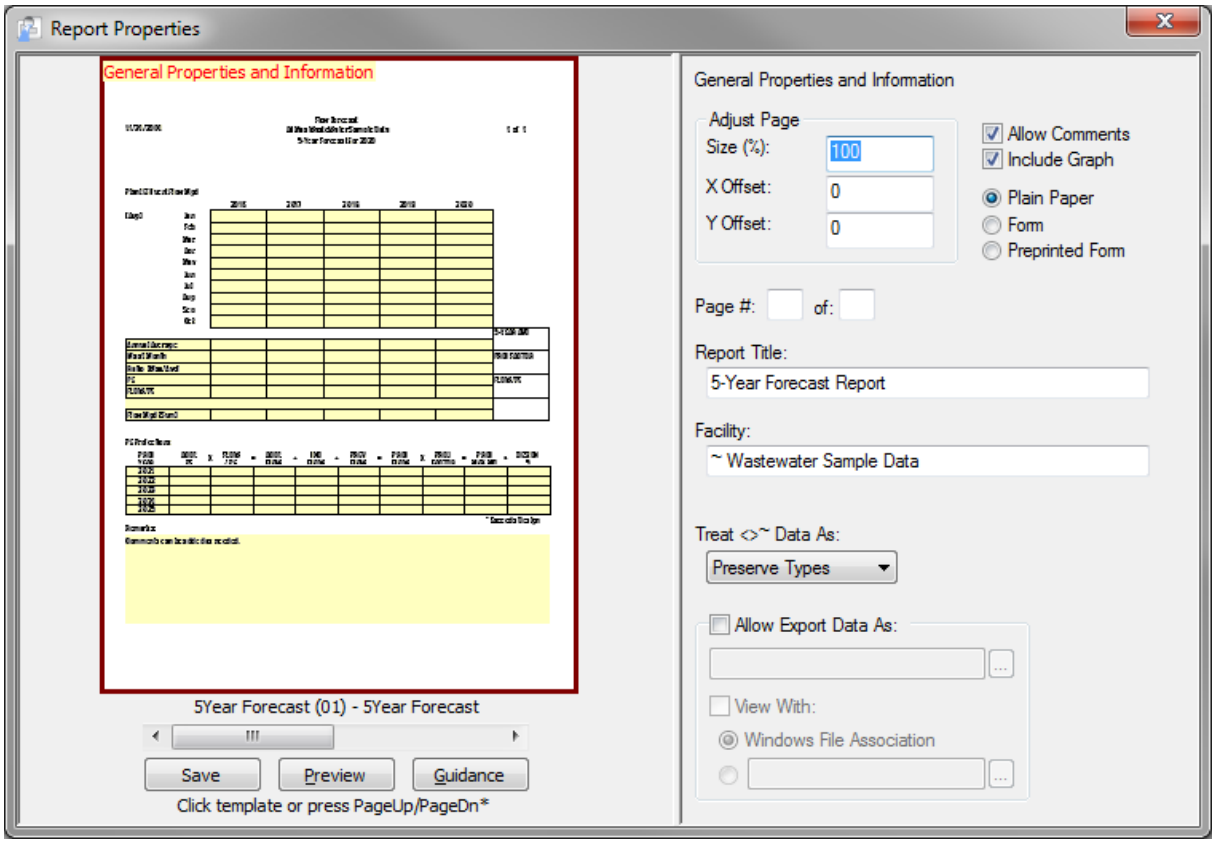

9.7.2.1.1.2 Parameter and Calculations

In the **Parameter and Calculation Settings** setup section for the 5-Year Forecast Report, users can edit the following fields:

Parameter and Calculation Settings

Location:Parameter:
Press the **[...]** button to select a Location:Parameter to be reported on the 5 Year Forecast Report. Find the Location:Parameter in the Location:Parameter Picklist that appears and press the **[Select]** button.

Header:
To modify the header of the selected Location:Parameter, modify this field.

Report Label:
Enter the report label for Location:Parameter selected.

Decimal:
Indicate the desired number of decimal precision to be shown on the report.

Calculation Type:
Select the type of calculation to be performed on the selected Location:Parameter. Select from **Month Sum, Month Average, Month Maximum, Month Minimum, Month Count, Month Formula, Geometric Mean, Standard Deviation, Max 7-Day Continuous, Min 7-Day Continuous, Max 7-Day First of Month,** or **Min 7-Day First of Month** from the drop-down list box.

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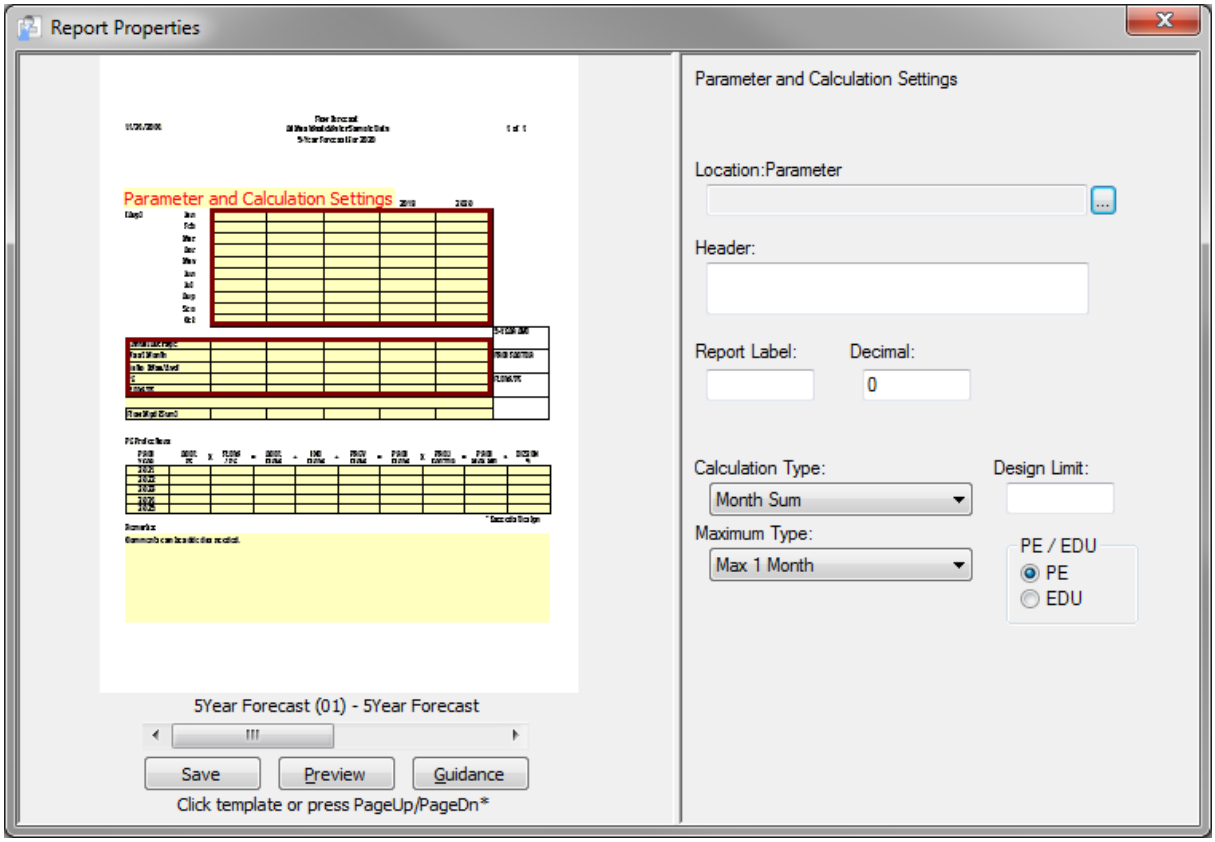
Maximum Type:
Choose the correct maximum type for the report, choose from **Maximum 1 Month** or **Max 3 Month Avg**.

Design Limit:
Enter the design limit for comparison with PE/EDU calculations.

PE/EDU:
Choose the calculation method by select the option **()PE** or **()EDU**.



9.7.2.1.1.3 Additional Parameter

In the **Additional Parameter** setup section for the 5-Year Forecast Report, users can edit the following fields:

Additional Parameter

Location:Parameter:
Press the **[...]** button to select a Location:Parameter to be reported on the 5 Year Forecast Report. Find the Location:Parameter in the Location:Parameter Picklist that appears and press the **[Select]** button.

Header:
To modify the header of the selected Location:Parameter, modify this field.

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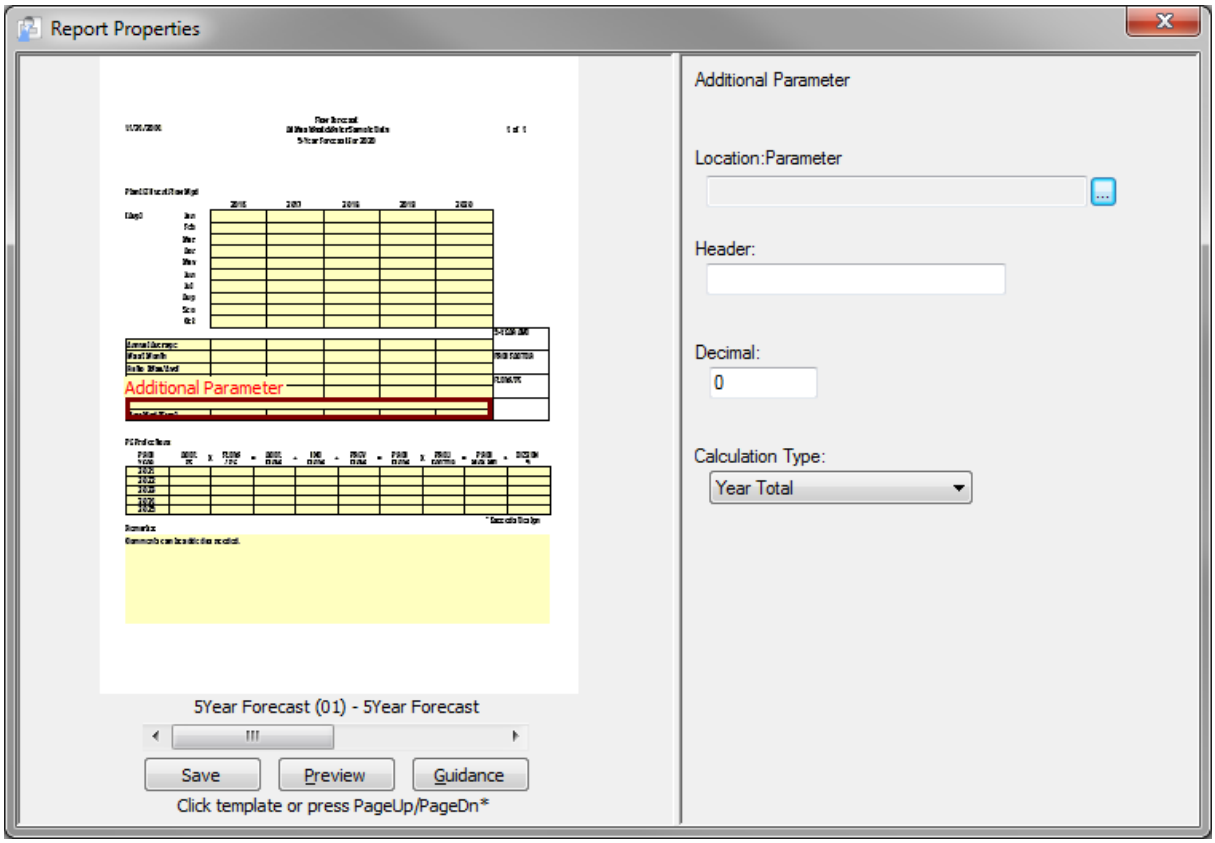
Decimal:
Indicate the desired number of decimal precision to be shown on the report.

Calculation Type:
Select the type of calculation to be performed on the selected Location:Parameter. Select from Year Total or Year Average from the drop-down list box.



9.7.2.1.1.4 PE/EDU and Industry Projections

In the **PE/EDU and Industry Projections** setup section for the 5-Year Forecast Report, users can edit the following fields:

PE/EDU and Industry Projections

For **PE/EDU and Industry Projections**, enter the previous and projected totals and increases for the specified years. Enter the values directly into the labeled fields.

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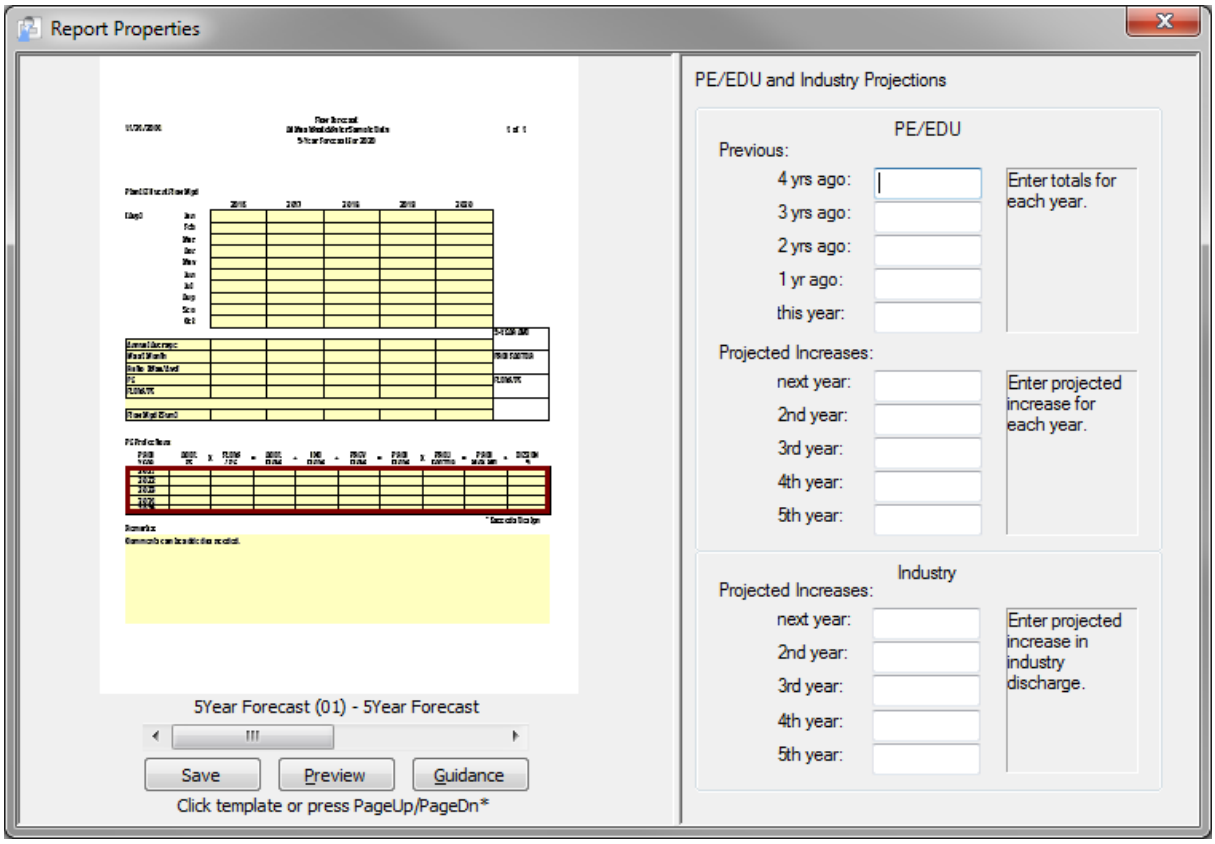

9.7.2.1.1.5 Comments

In the **Comments** setup section for the 5-Year Forecast Report, users can edit the following information:

Comments:

Enter the default comments to appear on report at the time of printing. Users can modify these comments at the time of printing if the **[ ]Allow Comments** checkbox is marked in the General Properties and Settings screen.

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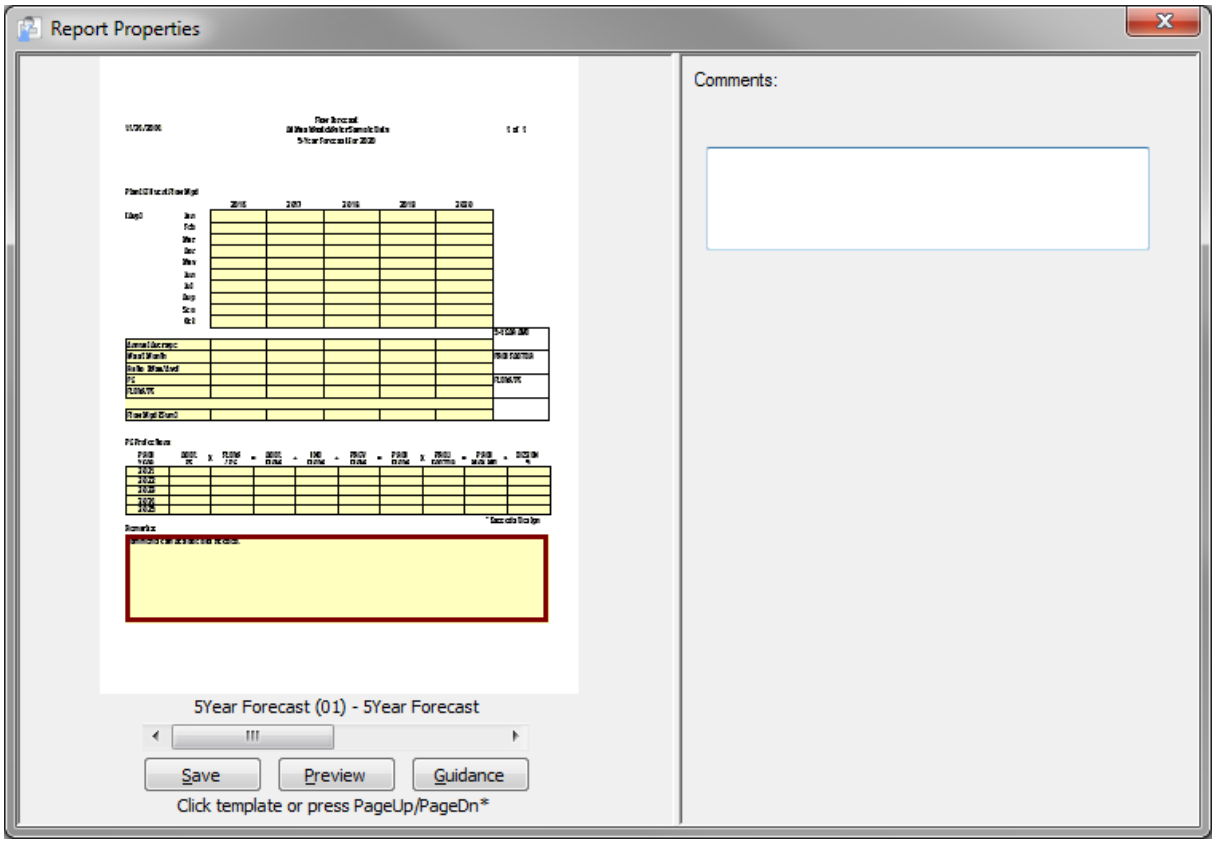

9.7.2.2 Multi-Year Summary Report

The **Multi-Year Summary Report** provides information for multiple years of data. The form can report up to 8 columns containing the Sum, Average, Maximum, Minimum, Maximum, or Count of Daily Values, the Average, Maximum, or Minimum Monthly Average, the Average, Maximum, or Minimum Daily Loading, or the Average, Maximum, or Minimum Monthly Average Loading.

Multi-Year Summary Report Setup options include:

- General Properties and Information
- Parameters
- Summary Columns
- Comments

9.7.2.2.1 Multi-Year Summary Setup

Topics in this section include:

- General Properties and Information
- Parameters
- Summary Columns
- Comments

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9.7.2.2.1.1 General Properties

In the **General Properties and Information** setup section for the Multi-Year Summary Report, users can edit the following fields:

Page Adjustment and Print Settings:

Size (%):
Enter a percentage to which you would like to reduce the printed form.

X Offset:
Adjust the X coordinate to which you would like to offset the printed form.

Y Offset:
Adjust the Y coordinate to which you would like to offset the printed form.

Beginning Page #:
Enter the beginning page #. The Multi-Year Report will continue to number subsequent pages if applicable. Leave this field blank to use default numbering.

Header:
Enter up to 3 (three) lines of text to be used as a header for the Limit Report. The default header will be the Facility Address.

Facility:
To customize the name of the facility on this report, enter it into this field. The field will be set to the default facility name coming from the name of your current facility.

[]Allow Comments:
To enter comments at the time of printing, check the **[ ]Allow Comments** checkbox.

Treat <>~ Data As:
Select from the drop-down menu to determine the method by which data with the less-than (<), greater-than (>) or non-detect (~) data qualifiers will be treated.

Available options are:

- **Preserve Types:** Calculations will preserve the available data qualifiers and calculated results will display the appropriate data qualifier.

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = <3 as the less-than symbol to be preserved for the final calculation

- **Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using only the numeric entered portion of the data

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = 3 as the less than symbol will be dropped for the final calculation

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- **Half Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using one-half the entered value of the data

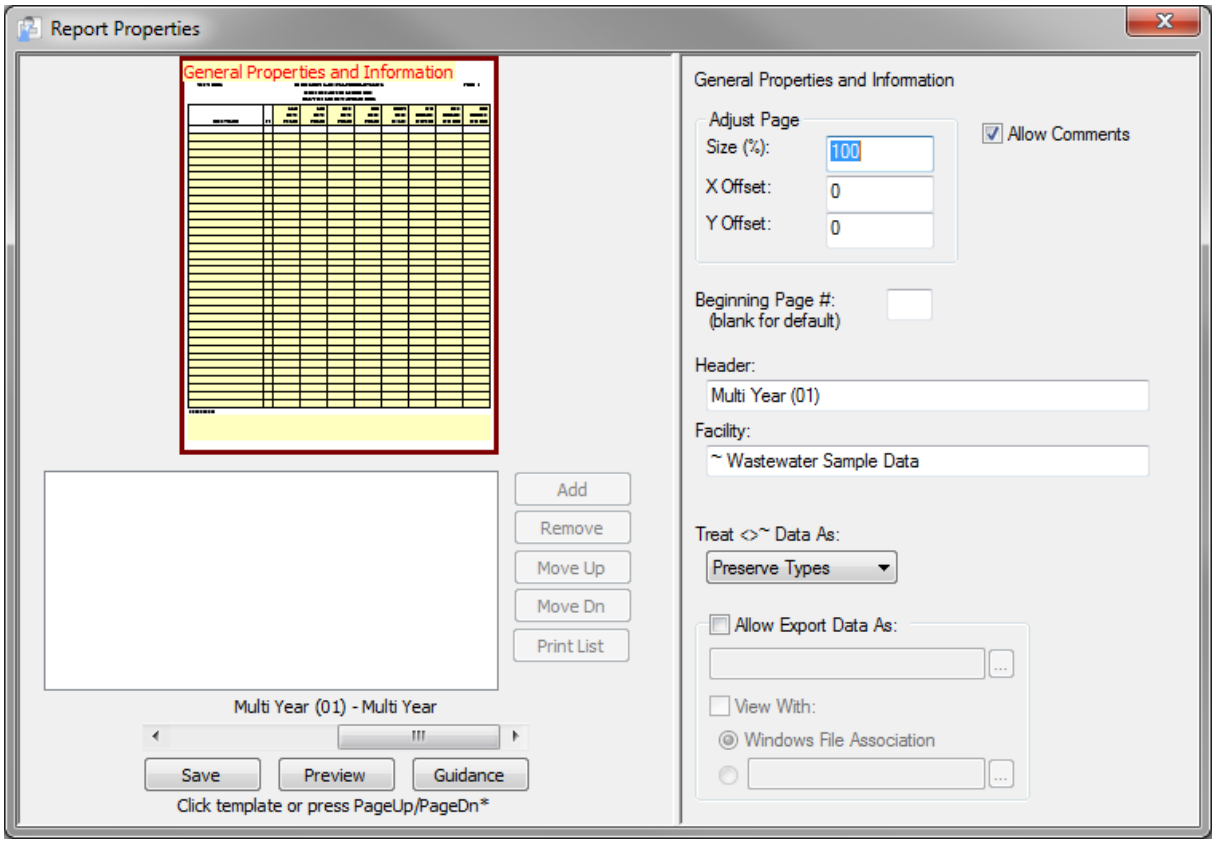
  Example: results = 3, 6, <2, 1; average = (3+6+1+1)/4 = 2.75 as the less than symbol is dropped and 2 is divided in half for final calculation

- **Zero:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using zero (0) in place of any entered data

  Example: results = 3, 6, <2, 1; average = (3+6+0+1)/4 = 2.5 as the less than symbol is dropped and 0 is used in place of <2 for the final calculation

- **Blank (no data):** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers treating data entered with qualifiers to be seen as blank.

  Example: results = 3, 6, <2, 1; average = (3+6+1)/3 = 3.333 as the less than symbol is dropped and no data is used in place of <2 in the final calculation



9.7.2.2.1.2 Parameters

In the **Parameters** setup section for the Multi-Year Summary Report:

Parameters

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To ADD Location:Parameters

To add values to the Multi-Year Summary report, press the **[Add]** button to select from the Location:Parameter (Multi-select) Picklist. Highlight a desired Location:Parameter and press the **[Select]** button in the Picklist.

> ***NOTE:*** **Location:Parameters** may be selected more than once to allow for multiple calculations and limits.

Location:Parameter Definition

Once the Location:Parameter has been added, edit the following fields to define:

Header:
A default Header, based on the Location:Parameter selected, will be filled in here, modify the header if desired. There are two lines of text available for each header.

Number of Years
Select the number of years to be calculated for the selected Location:Parameter. Choose from the drop-down list box.

Decimal
Default decimal precision, based on the selected Location:Parameter will be shown in the Decimal field, modify this value as necessary.

[Remove]
Press the [Remove] button to remove a selected Location:Parameter from the Limit Report.

[Move Up]/[Move Dn]
To re-arrange the order in which the selected Location:Parameters are shown on the Limit Report, press the [Move Up] or [Move Dn] button(s).

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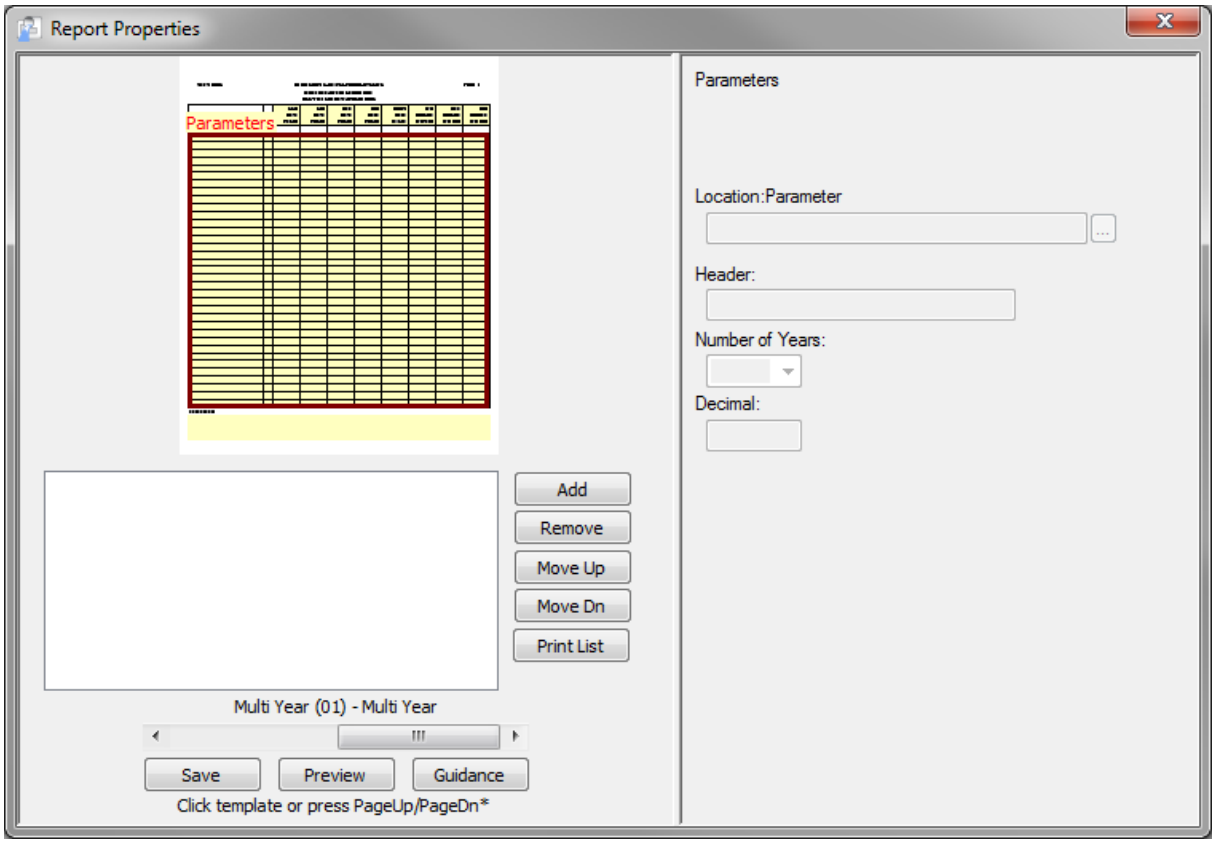

9.7.2.2.1.3 Summary Columns

In the **Summary Columns** setup section for the Multi Year Summary Report, users can choose from the following summary calculations for the selected location:parameters (select no more than 8):

Calculation Options:

- **Sum Daily**
- **Avg Daily**
- **Max Daily**
- **Min Daily**
- **Count Daily**
- **Avg Monthly**
- **Max Monthly**
- **Min Monthly**
- **Avg Loading**
- **Max Loading**
- **Min Loading**
- **Avg Mo. Loading**
- **Max Mo. Loading**
- **Min Mo. Loading**

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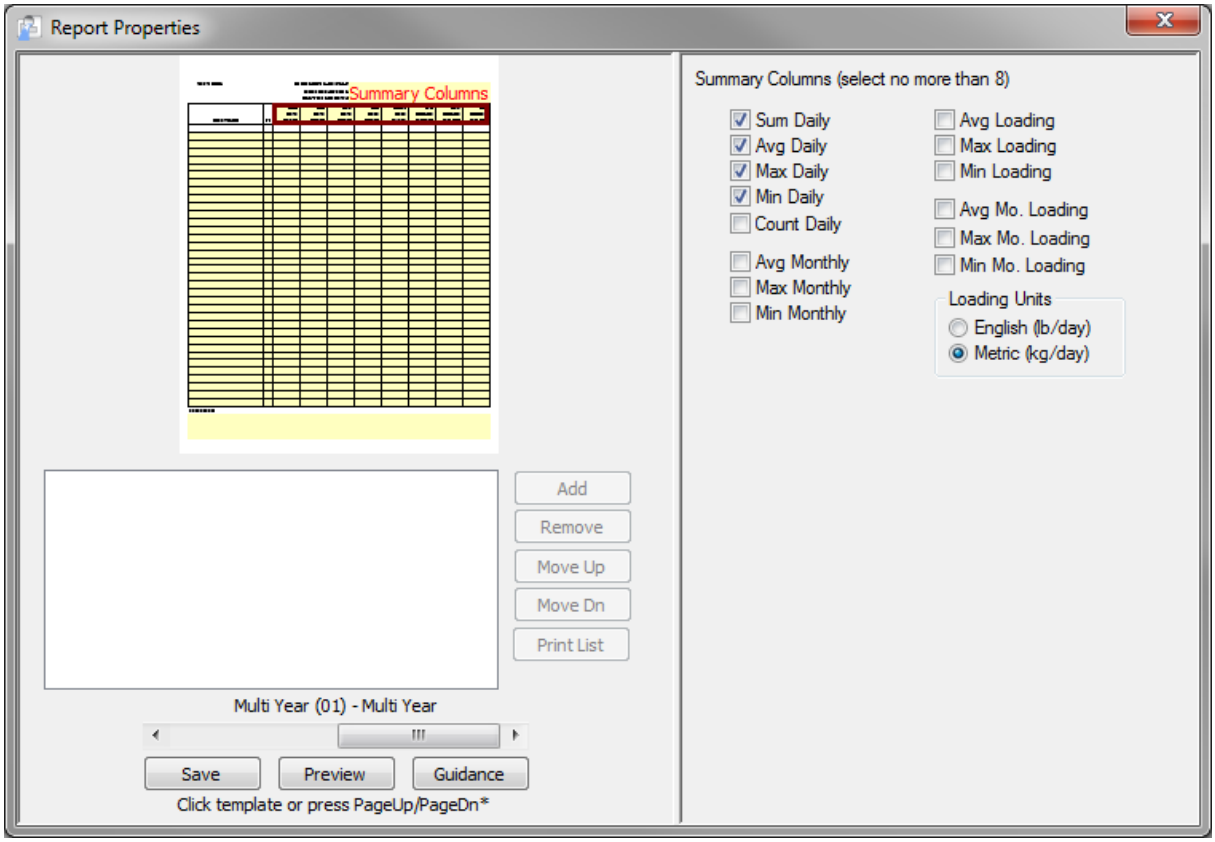
For Loading summaries, choose from **( )English (lb/day)** or **( )Metric (kg/day)** to determine calculation method.



9.7.2.2.1.4 Comments

In the **Comments** setup section for the Multi-Year Summary Report, users can edit the following fields:

Comments

Comments:
Enter the default comments to appear on report at the time of printing. Users can modify these comments at the time of printing if the **[ ]Allow Comments** checkbox is marked in the General Properties screen.

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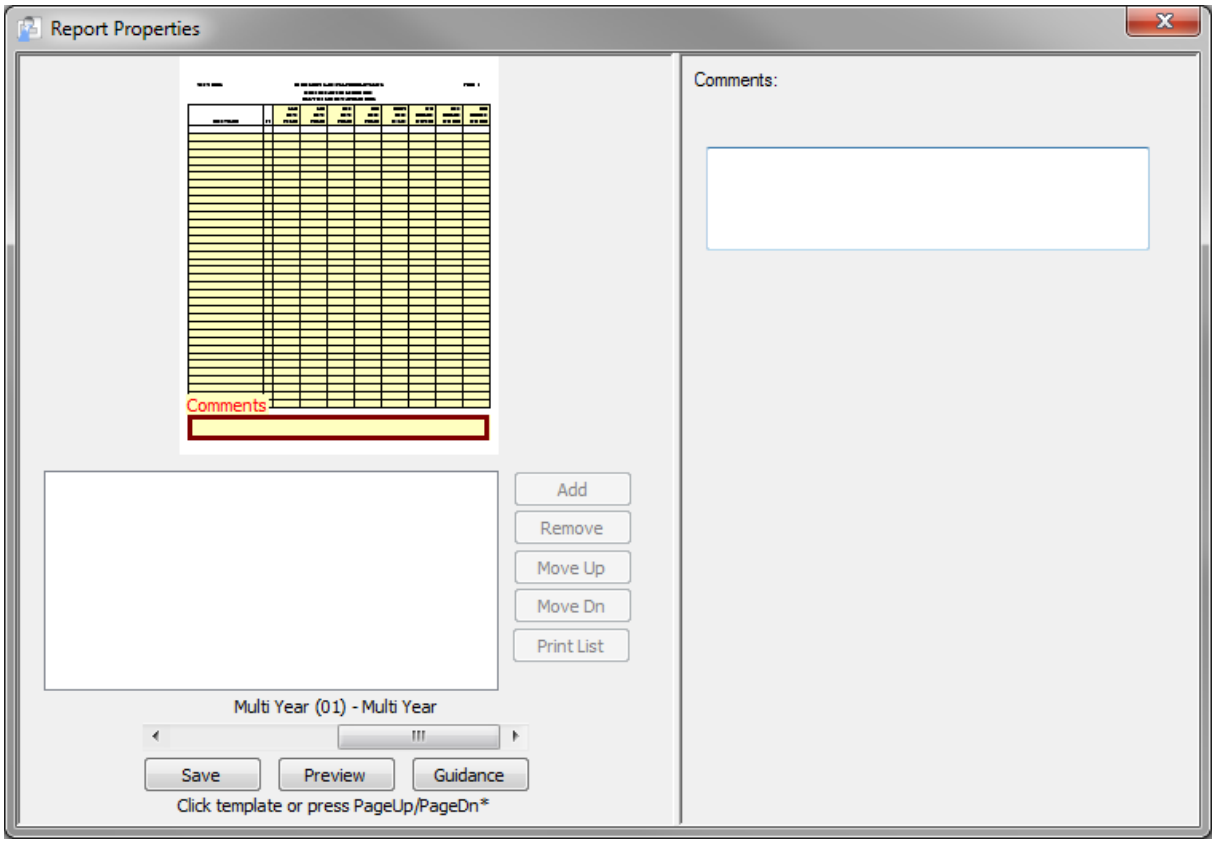

9.7.3 Mass Balance Reports

The **Mass Balance** report was designed to allow the quantification of material flow in to and out of a given process. The report determines if all streams and production growth in and out of a process is accounted for.

There are four setup sections:

- General Properties
- General Information
- Rows
- Comments

9.7.3.1 Mass Balance Report Setup

Topics in this section include:

- General Properties
- General Information
- Rows
- Comments

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9.7.3.1.1 General Properties

In the **General Properties** setup section for the Mass Balance Report, users can edit the following fields:

Page Adjustment and Print settings:

Size (%):
Enter a percentage to which you would like to reduce the printed form.

X Offset:
Adjust the X coordinate to which you would like to offset the printed form.

Y Offset:
Adjust the Y coordinate to which you would like to offset the printed form.

()Plain Paper:
Mark the **( )Plain Paper** radio button to print the entire form, including all lines, headers, and data.

()Form:
Mark the **( )Form** radio button if you are printing directly on, or will be copying onto a blank form.

Preprinted Form:
If generic information is already preprinted on the form, mark the **( )Preprinted Form** radio button to print only the data and appropriate information.

[]Allow Comments:
To enter comments at the time of printing, check the **[ ]Allow Comments** checkbox.

Calculate Increase Using:
Three options are available to calculate increase using:

- **First and last value** - uses the first and the last values of the month to determine the increase.
- **First and last week** - uses the average of the first 7 days and the last 7 days of the month to determine the increase.
- **Month averages** - uses the averages for the current and previous months to determine the increase.

Multiplier:
Enter a mulitplier for calculating solids production.

Decimal:
Enter the decimal precision for the overall report.

Loading Units:
Select the units in which loadings are reported:

- **()kilograms/day**
- **()grams/day**
- **()pounds/day**

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Treat <>~ Data As:
Select from the drop-down menu to determine the method by which data with the less-than (<), greater-than (>) or non-detect (~) data qualifiers will be treated.

Available options are:

- **Preserve Types:** Calculations will preserve the available data qualifiers and calculated results will display the appropriate data qualifier.

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = <3 as the less-than symbol to be preserved for the final calculation

- **Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using only the numeric entered portion of the data

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = 3 as the less than symbol will be dropped for the final calculation

- **Half Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using one-half the entered value of the data

  Example: results = 3, 6, <2, 1; average = (3+6+1+1)/4 = 2.75 as the less than symbol is dropped and 2 is divided in half for final calculation

- **Zero:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using zero (0) in place of any entered data

  Example: results = 3, 6, <2, 1; average = (3+6+0+1)/4 = 2.5 as the less than symbol is dropped and 0 is used in place of <2 for the final calculation

- **Blank (no data):** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers treating data entered with qualifiers to be seen as blank.

  Example: results = 3, 6, <2, 1; average = (3+6+1)/3 = 3.333 as the less than symbol is dropped and no data is used in place of <2 in the final calculation

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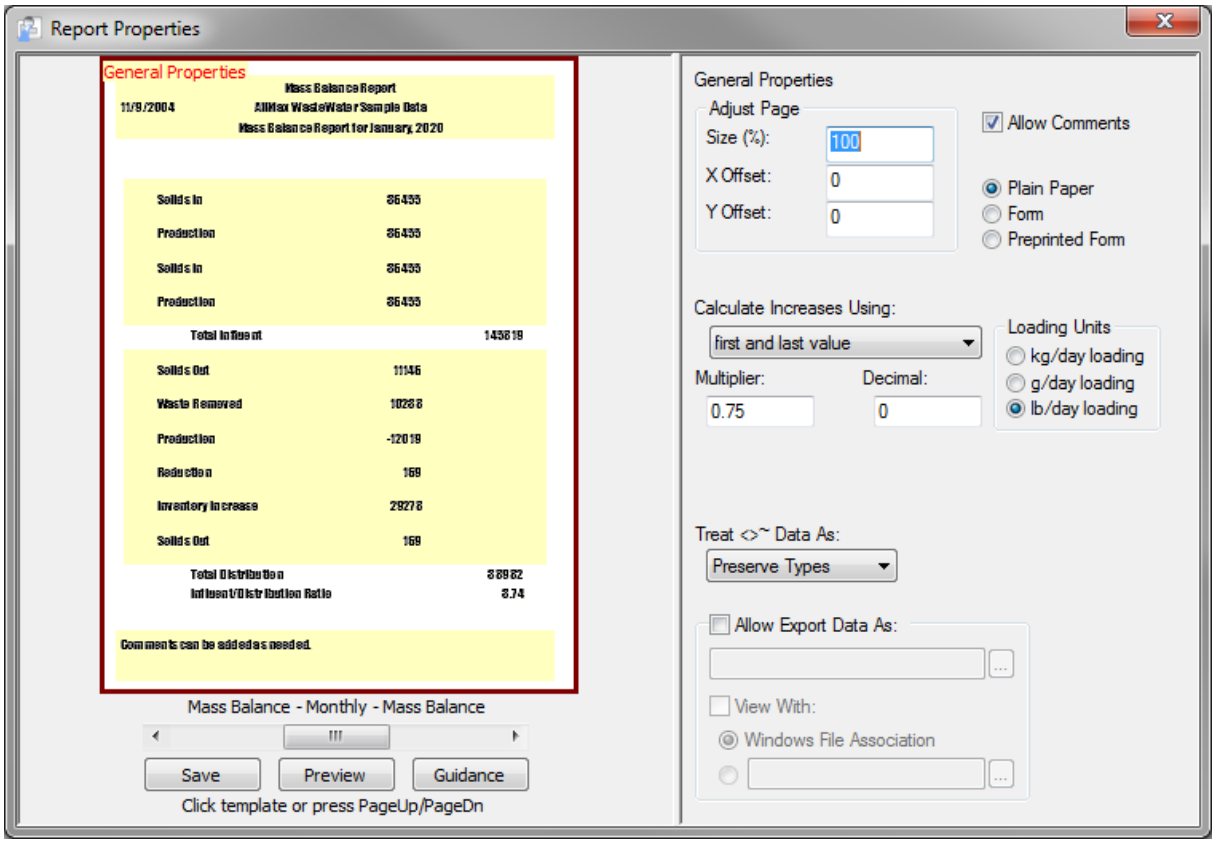

9.7.3.1.2 General Information

In the **General Information** setup section for the Mass Balance Report, users can edit the following fields:

General Information

Report Title:
Enter the desired title (1 to 40 characters) for the Mass Balance Report. This name is different than the report name shown in the Direct Access tree.

Facility:
Enter a facility name for the Mass Balance Report. The default facility name will initially be filled in, modify this as necessary.

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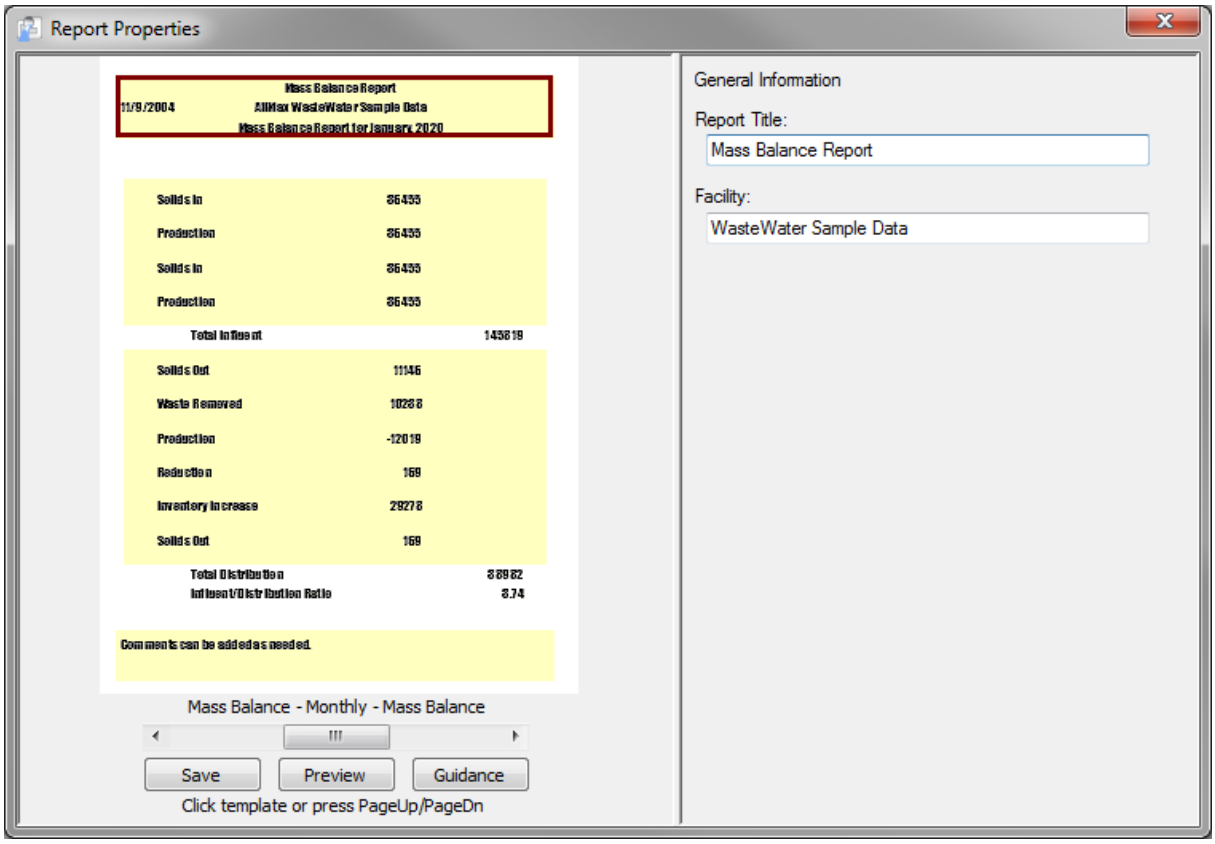

9.7.3.1.3 Rows

Report Rows

The report contains two sections, with an influent section on top and a distribution section on the bottom. The summaries of these sections will be used to determine the influent-to-distribution ratio.

Influent - upper section of the report contains four rows for selecting location:parameter combinations that represent streams contributing to the process. These can be where solids are produced and/or areas where a solids increase occurs. A name can be defined as a header for each row that will be displayed on the report.

Distribution - lower section of the report contains six rows for selecting location:parameter combinations that represent streams discharged from the process. A name can be defined as a header for each row that will be displayed on the report.

Row Options - several options are available for each row of the report. Each parameter can be set to either **()Add** or **()Subtract** from the report section. The parameter can also be set to **calculated loading**, **calculate increase**, and **calculate** using the multiplier by checking the desired option(s).

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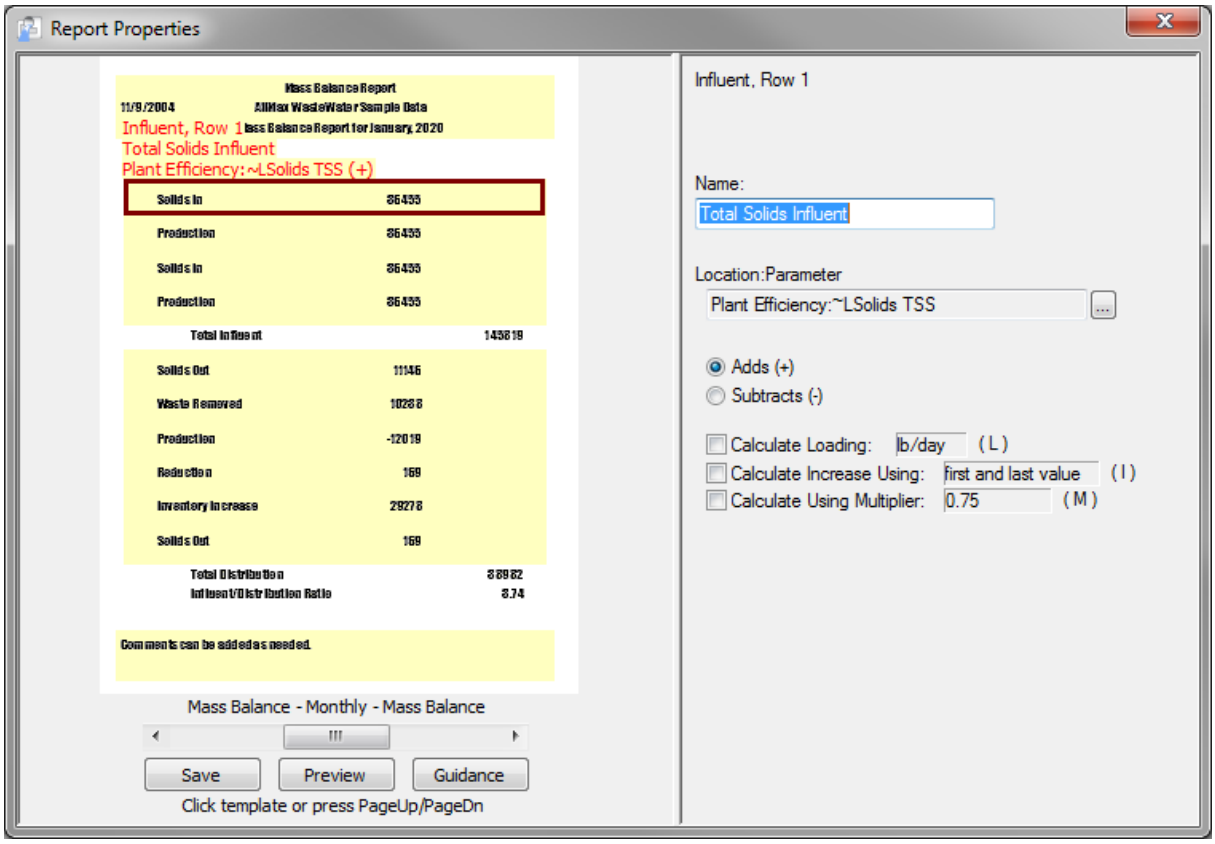

9.7.3.1.4 Comments

In the **Comments** setup section for the Mass Balance Report, users can edit the following fields:

Comments:

Comments:
Enter the default comments to appear on report at the time of printing. Users can modify these comments at the time of printing if the **[]Allow Comments** checkbox is marked in the General Properties screen.

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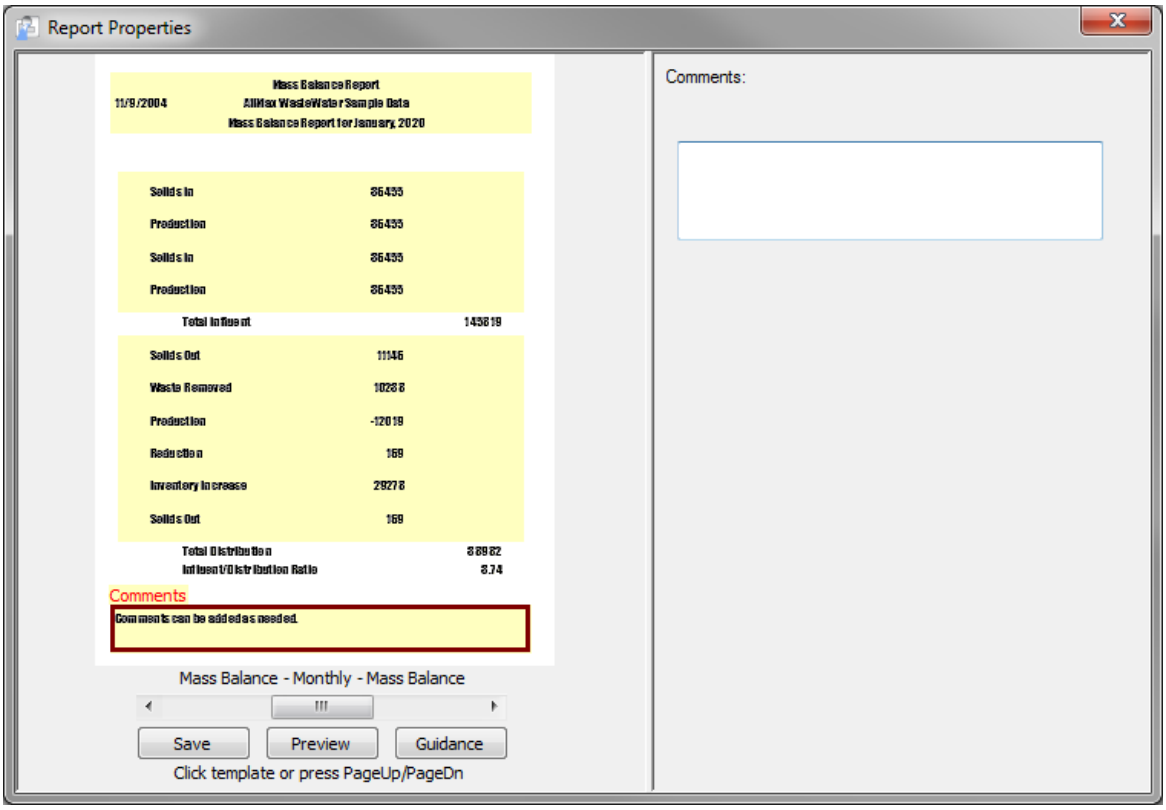

9.7.4 Limit Report

A **Limit Report** provides the ability to set upper and lower data limits for early error or limit detection, for any Parameter based upon quantity and concentration.

Setup options for the Limit Report include:

- General Properties
- General Information
- Limits
- Comments

9.7.4.1 Limit Report Setup

Topics in this section include:

- General Properties
- General Information
- Limits
- Comments

9.7.4.1.1 General Properties

In the **General Properties** setup section for the Limit Report, users can edit the following fields:

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Page Adjustment and Print settings:

Size (%):
Enter a percentage to which you would like to reduce the printed form.

X Offset:
Adjust the X coordinate to which you would like to offset the printed form.

Y Offset:
Adjust the Y coordinate to which you would like to offset the printed form.

[]Allow Comments:
To enter comments at the time of printing, check the []Allow Remarks checkbox.

Months:
Select a number of months from the drop-down list box. The report will calculate the desired amount of data based on this selection.

Treat <>~ Data As:
Select from the drop-down menu to determine the method by which data with the less-than (<), greater-than (>) or non-detect (~) data qualifiers will be treated.

Available options are:

- **Preserve Types:** Calculations will preserve the available data qualifiers and calculated results will display the appropriate data qualifier.

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = <3 as the less-than symbol to be preserved for the final calculation

- **Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using only the numeric entered portion of the data

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = 3 as the less than symbol will be dropped for the final calculation

- **Half Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using one-half the entered value of the data

  Example: results = 3, 6, <2, 1; average = (3+6+1+1)/4 = 2.75 as the less than symbol is dropped and 2 is divided in half for final calculation

- **Zero:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using zero (0) in place of any entered data

  Example: results = 3, 6, <2, 1; average = (3+6+0+1)/4 = 2.5 as the less than symbol is dropped and 0 is used in place of <2 for the final calculation

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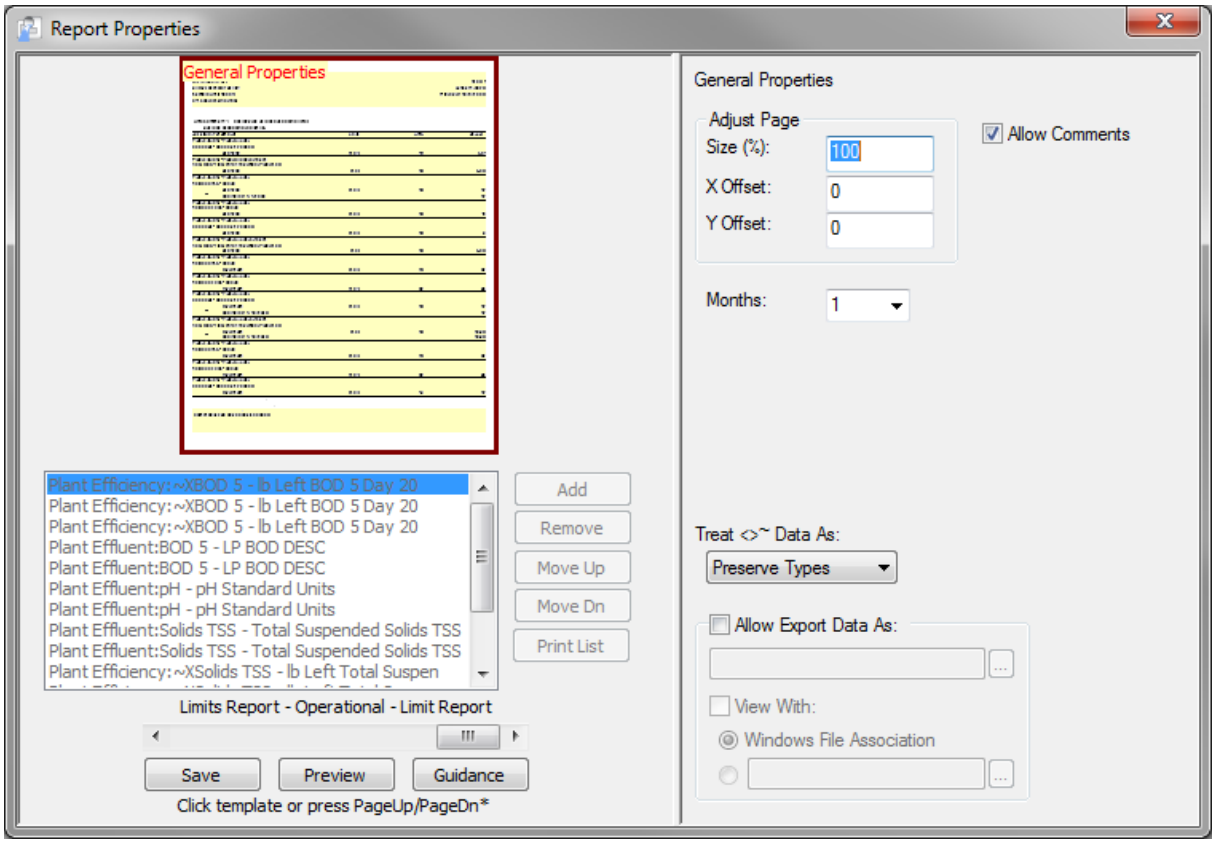
- **Blank (no data):** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers treating data entered with qualifiers to be seen as blank.

  Example: results = 3, 6, <2, 1; average = (3+6+1)/3 = 3.333 as the less than symbol is dropped and no data is used in place of <2 in the final calculation



9.7.4.1.2 General Information

In the **General Information** setup section for the Limit Report, users can edit the following fields:

General Information:

Report Name:
Enter the desired name (1 to 40 characters) for the Limit Report. This name is different than the report name shown in the Direct Access tree.

Facility:
Enter a facility name for the Limit Report. The default facility name will initially be filled in, modify this as necessary.

Header:
Enter up to 3 (three) lines of text to be used as a header for the Limit Report. The default header will be the Facility Address.

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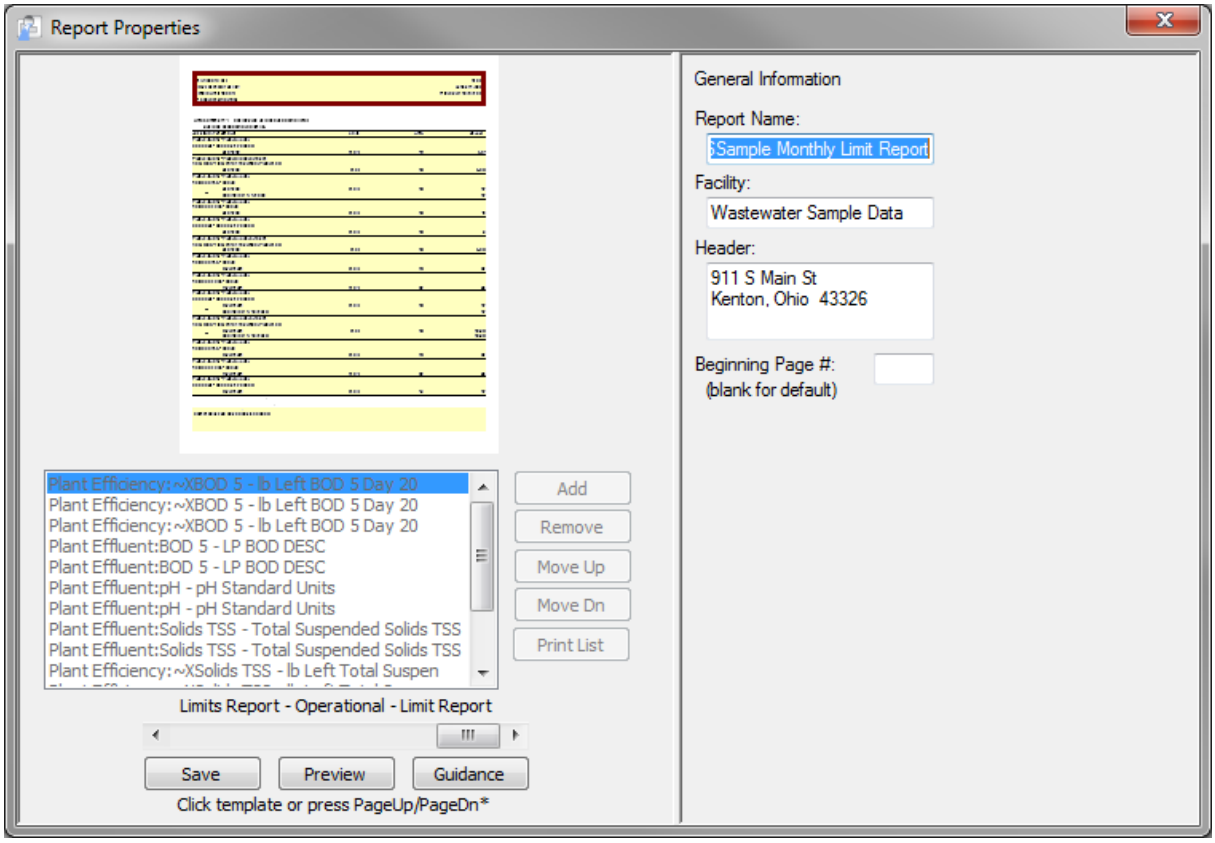
Beginning Page #
Enter the beginning page #. The Limit Report will continue to number subsequent pages if applicable. Leave this field blank to use default numbering.


Report Properties
General Information
Report Name:
Sample Monthly Limit Report
Facility:
Wastewater Sample Data
Header:
911 S Main St
Kenton, Ohio 43326
Beginning Page #:
(blank for default)
Plant Efficiency:~XBOD 5 - lb Left BOD 5 Day 20
Plant Efficiency:~XBOD 5 - lb Left BOD 5 Day 20
Plant Efficiency:~XBOD 5 - lb Left BOD 5 Day 20
Plant Effluent:BOD 5 - LP BOD DESC
Plant Effluent:BOD 5 - LP BOD DESC
Plant Effluent:pH - pH Standard Units
Plant Effluent:pH - pH Standard Units
Plant Effluent:Solids TSS - Total Suspended Solids TSS
Plant Effluent:Solids TSS - Total Suspended Solids TSS
Plant Efficiency:~XSolids TSS - lb Left Total Suspen
Add
Remove
Move Up
Move Dn
Print List
Limits Report - Operational - Limit Report
Save
Preview
Guidance
Click template or press PageUp/PageDn*

9.7.4.1.3 Limits

In the Limits setup section for the Limit Report:

Location:Parameter Setup

To ADD Location:Parameters

To add values to the limit report, press the **[Add]** button to select from the Location:Parameter (Multiselect) Picklist. Highlight a desired Location:Parameter and press the **[Select]** button in the Picklist.

> ***NOTE:*** Location:Parameters may be selected more than once to allow for multiple calculations and limits.

Location:Parameter Definition

Once the Location:Parameter has been added, edit the following fields to define your limit.

Header:

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A default Header, based on the Location:Parameter selected, will be filled in here, modify the header if desired. There are two lines of text available for each header.

Calculation:
Press the **[...]** button to select from the **Formula** Picklist, click **[Select]** to choose the highlighted formula. (see also: Report Calculations)

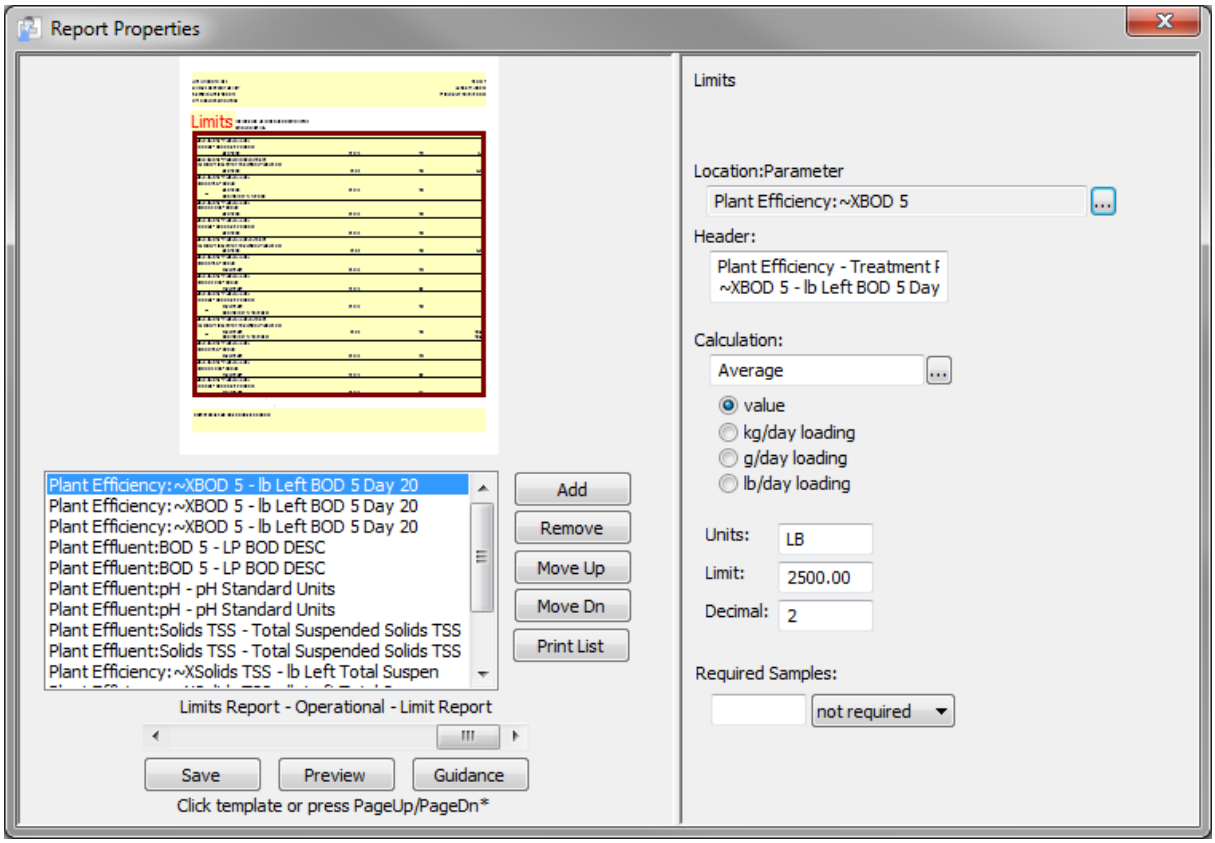
Units:
Default **Units** will be shown based on the selected Location:Parameter. Modify this field as desired.

Limit:
Enter the actual **Limit** value (1 to 14 characters). A double asterisk (**) on the report will signify that the value has exceeded the specified Limit.

Decimal:
Default decimal precision, based on the selected Location:Parameter will be shown in the Decimal field, modify this value as necessary.

[Remove]
Press the **[Remove]** button to remove a selected Location:Parameter from the Limit Report.

[Move Up]/[Move Dn]
To re-arrange the order in which the selected Location:Parameters are shown on the Limit Report, press the **[Move Up]** or **[Move Dn]** button(s).



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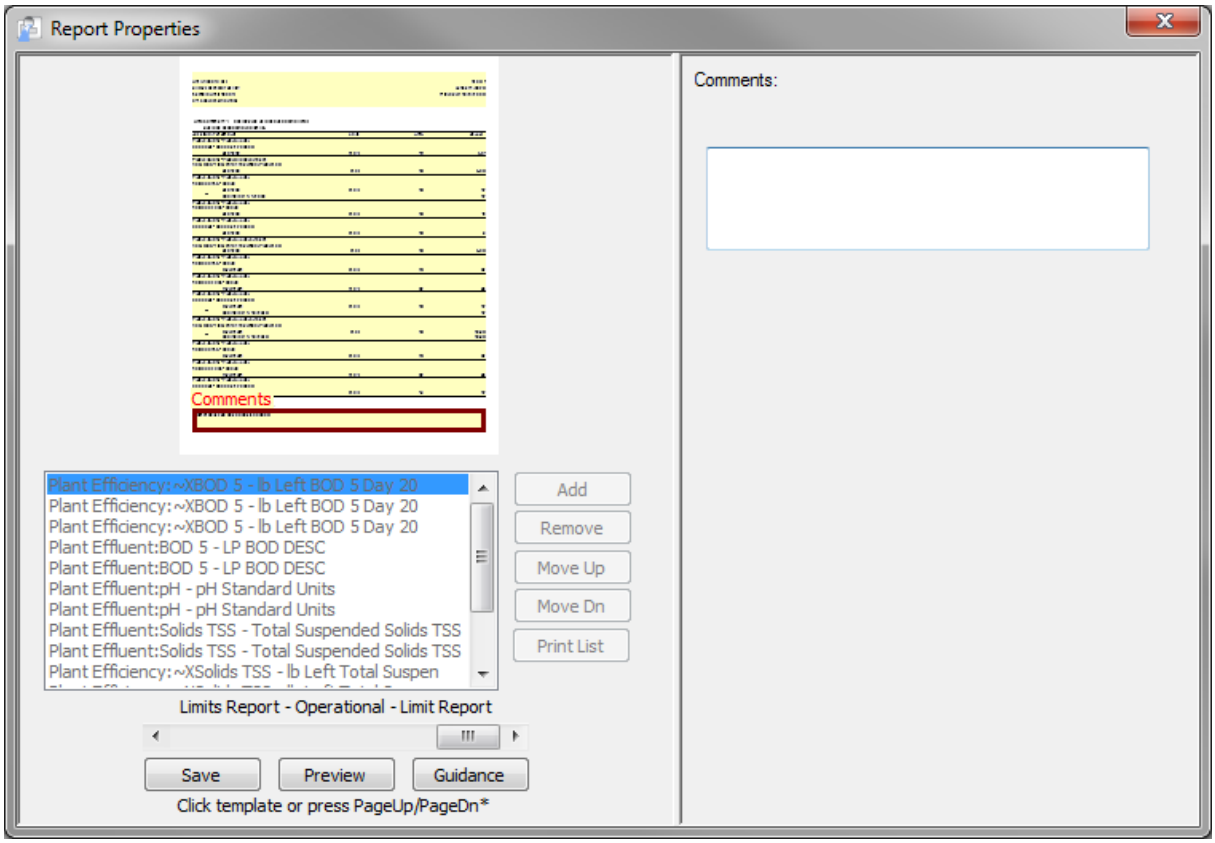
9.7.4.1.4 Comments

In the Comments setup section for the Limit Report, users can edit the following information:

Comments:

Comments:
Enter the default comments to appear on report at the time of printing. Users can modify these comments at the time of printing if the [ ]Allow Comments checkbox is marked in the General Properties and Settings screen.


Report Properties
Comments:
Comments
Plant Efficiency:~XBOD 5 - lb Left BOD 5 Day 20
Plant Efficiency:~XBOD 5 - lb Left BOD 5 Day 20
Plant Efficiency:~XBOD 5 - lb Left BOD 5 Day 20
Plant Effluent:BOD 5 - LP BOD DESC
Plant Effluent:BOD 5 - LP BOD DESC
Plant Effluent:pH - pH Standard Units
Plant Effluent:pH - pH Standard Units
Plant Effluent:Solids TSS - Total Suspended Solids TSS
Plant Effluent:Solids TSS - Total Suspended Solids TSS
Plant Efficiency:~XSolids TSS - lb Left Total Suspen
Add
Remove
Move Up
Move Dn
Print List
Limits Report - Operational - Limit Report
Save
Preview
Guidance
Click template or press PageUp/PageDn*

9.7.5 Weekly Summary Report

A **Weekly Summary Report** provides the ability to define Location:Parameters for the report which displays a month's worth of data, broken into weekly summary periods, allowing for users to see the Weekly Maximum and Minimum. Month types are selected to define how the weekly periods are defined and what data is to be used in reporting.

Setup options for the Weekly Summary Report include:

- General Properties
- General Information
- Parameters
- Comments

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9.7.5.1 Weekly Report Setup

Topics in this section include:

- General Properties
- General Information
- Parameters
- Comments

9.7.5.1.1 General Properties

In the General Properties setup section for the Weekly Summary Report, users can edit the following fields:

Page Adjustment and Print settings:

Size (%):
Enter a percentage to which you would like to reduce the printed form.

X Offset:
Adjust the X coordinate to which you would like to offset the printed form.

Y Offset:
Adjust the Y coordinate to which you would like to offset the printed form.

[]Allow Comments:
To enter comments at the time of printing, check the []Allow Remarks checkbox.

Month Type:
Select from the drop-down menu to determine the method by which weekly periods will be defined.

Available options are:

- **Continuous (Floating):** Data is averaged for several overlapping 7-day periods, beginning with the first of the month and continuing each consecutive day of the month until a period reaches the end of the month.
- **Saturday Rule:** Data is averaged for 7-day periods beginning on Sunday and extending though the following Saturday. Periods are considered to be in the month containing the Saturday of the period.
- **Wednesday Rule:** Data is averaged for 7-day periods beginning on Sunday and extending though the following Saturday. Periods are considered to be in the month containing the Wednesday of the period.
- **First of Month:** Data is averaged for three (3) 7-day periods, beginning with the first day of the month, and a fourth period extending to the end of the month.
- **Full Weeks Only:** Data is averaged for 7-day periods beginning on Sunday and extending though the following Saturday. Periods are considered to be in the month only if the entire period is in the month. Any additional days are ignored.

Treat <>~ Data As:
Select from the drop-down menu to determine the method by which data with the

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less-than (<), greater-than (>) or non-detect (~) data qualifiers will be treated.

Available options are:

- **Preserve Types:** Calculations will preserve the available data qualifiers and calculated results will display the appropriate data qualifier.

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = <3 as the less-than symbol to be preserved for the final calculation

- **Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using only the numeric entered portion of the data

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = 3 as the less than symbol will be dropped for the final calculation

- **Half Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using one-half the entered value of the data

  Example: results = 3, 6, <2, 1; average = (3+6+1+1)/4 = 2.75 as the less than symbol is dropped and 2 is divided in half for final calculation

- **Zero:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using zero (0) in place of any entered data

  Example: results = 3, 6, <2, 1; average = (3+6+0+1)/4 = 2.5 as the less than symbol is dropped and 0 is used in place of <2 for the final calculation

- **Blank (no data):** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers treating data entered with qualifiers to be seen as blank.

  Example: results = 3, 6, <2, 1; average = (3+6+1)/3 = 3.333 as the less than symbol is dropped and no data is used in place of <2 in the final calculation

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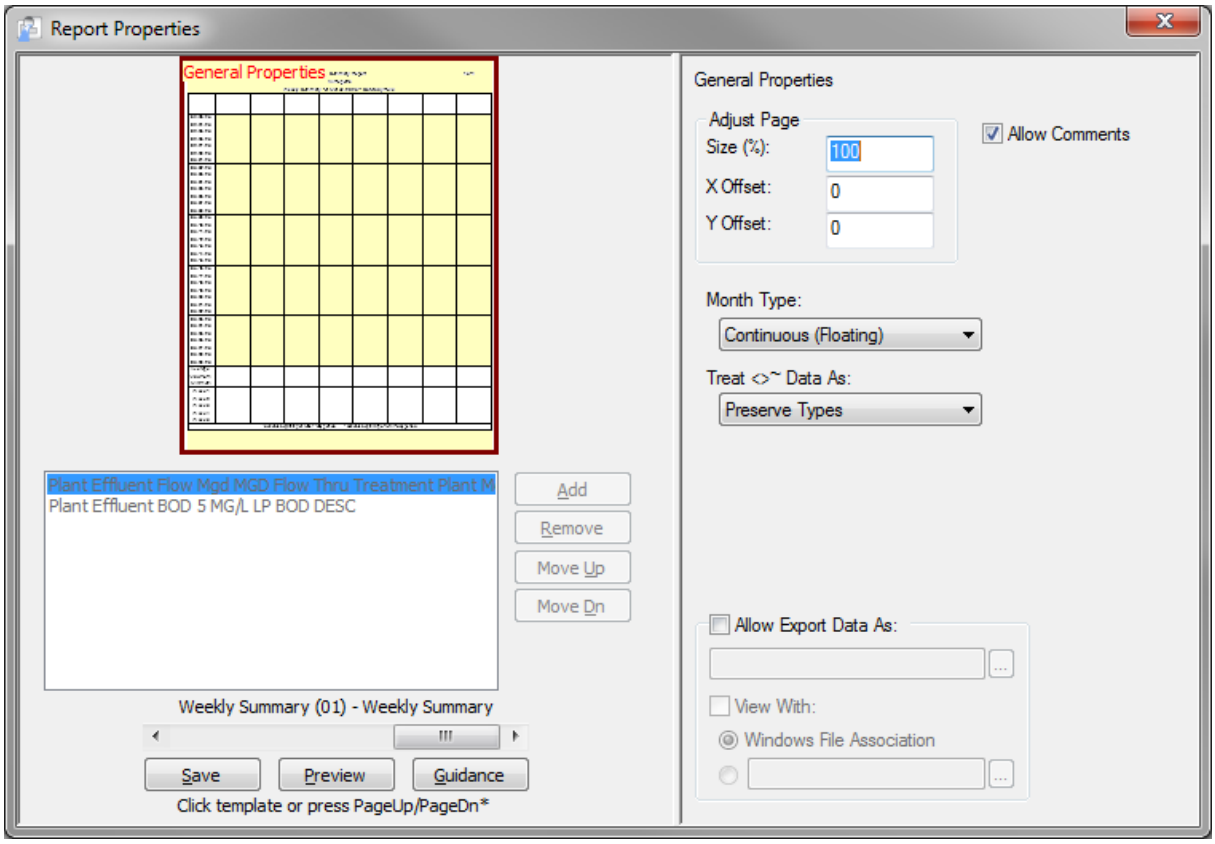

9.7.5.1.2 General Information

In the General Information setup section for the Weekly Summary Report, users can edit the following fields:

General Information:

Header:
Enter the desired header (1 to 40 characters) for the Weekly Summary Report.

Facility:
Enter a facility name for the Weekly Summary Report. The default facility name will initially be filled in, modify this as necessary.

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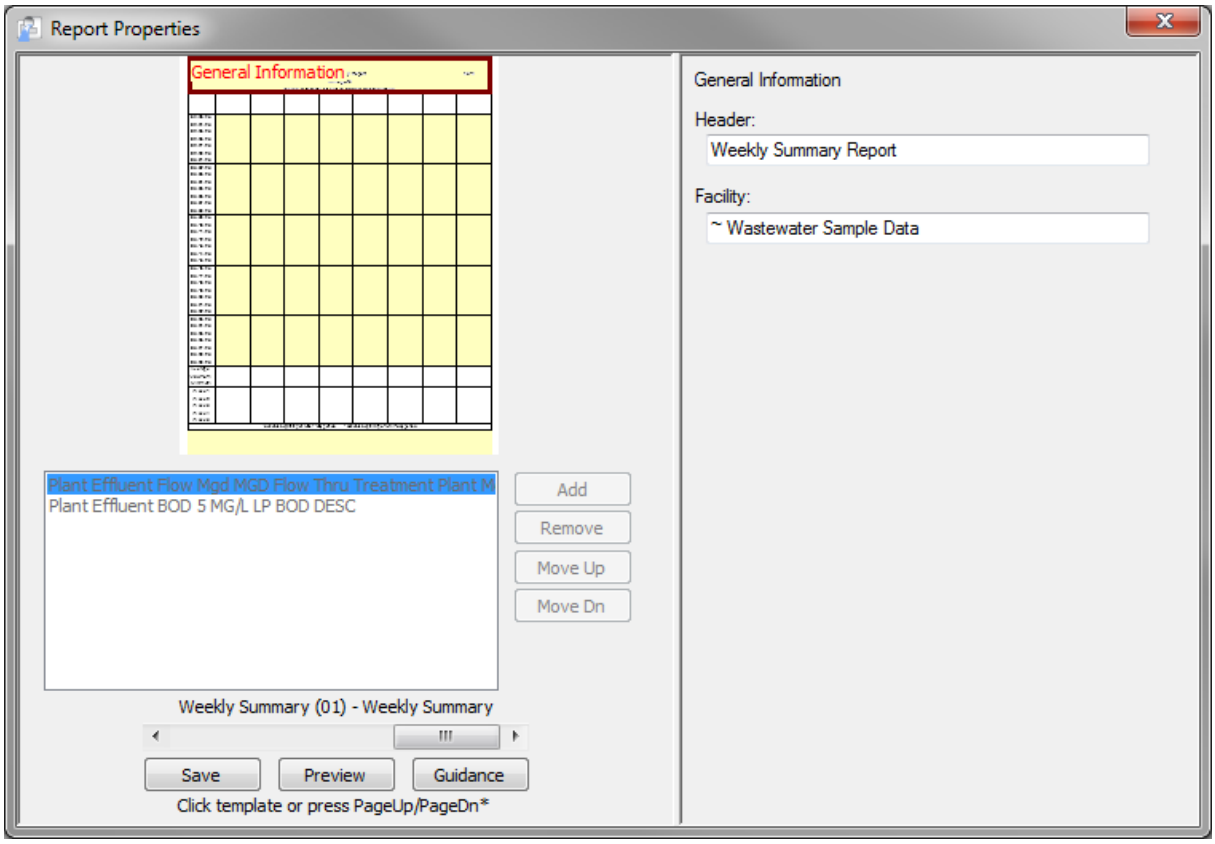

9.7.5.1.3 Parameters

In the **Parameters** setup section, users can select and define Location:Parameters to be displayed on the Weekly Summary Report.

Parameters

To ADD Location:Parameters

To add values to the weekly summary report, press the **[Add]** button to select from the Location:Parameter (Multi-select) Picklist. Highlight a desired Location:Parameter and press the **[Select]** button in the Picklist.

> ***NOTE:*** Location:Parameters may be selected more than once to allow for multiple calculations and limits.

Location:Parameter Definition

Once the Location:Parameter has been added, edit the following fields:

Header:
A default Header, based on the Location:Parameter selected, will be filled in here, modify the header if desired. There are two lines of text available for each header.

Decimal

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Default decimal precision, based on the selected Location:Parameter will be shown in the Decimal field, modify this value as necessary.

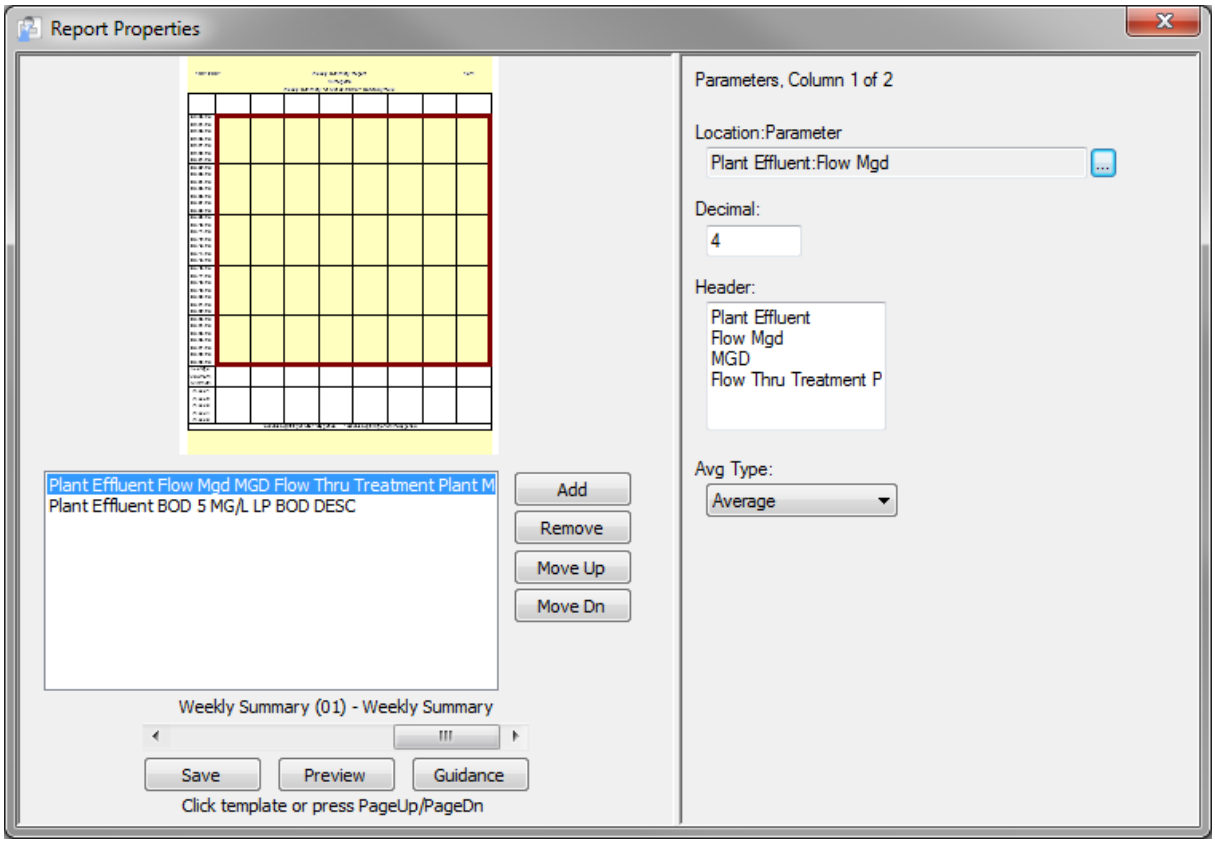
Avg Type:
Select from the drop-down menu, the type of Average to be calculated.

Available options include:

- **Average**
- **Geometric Mean**
- **Flow-Weighted**

[Remove]
Press the [Remove] button to remove a selected Location:Parameter from the Limit Report.

[Move Up]/[Move Dn]
To re-arrange the order in which the selected Location:Parameters are shown on the Limit Report, press the [Move Up] or [Move Dn] button(s).



9.7.5.1.4 Comments

In the Comments setup section for the Limit Report, users can edit the following information:

Comments:

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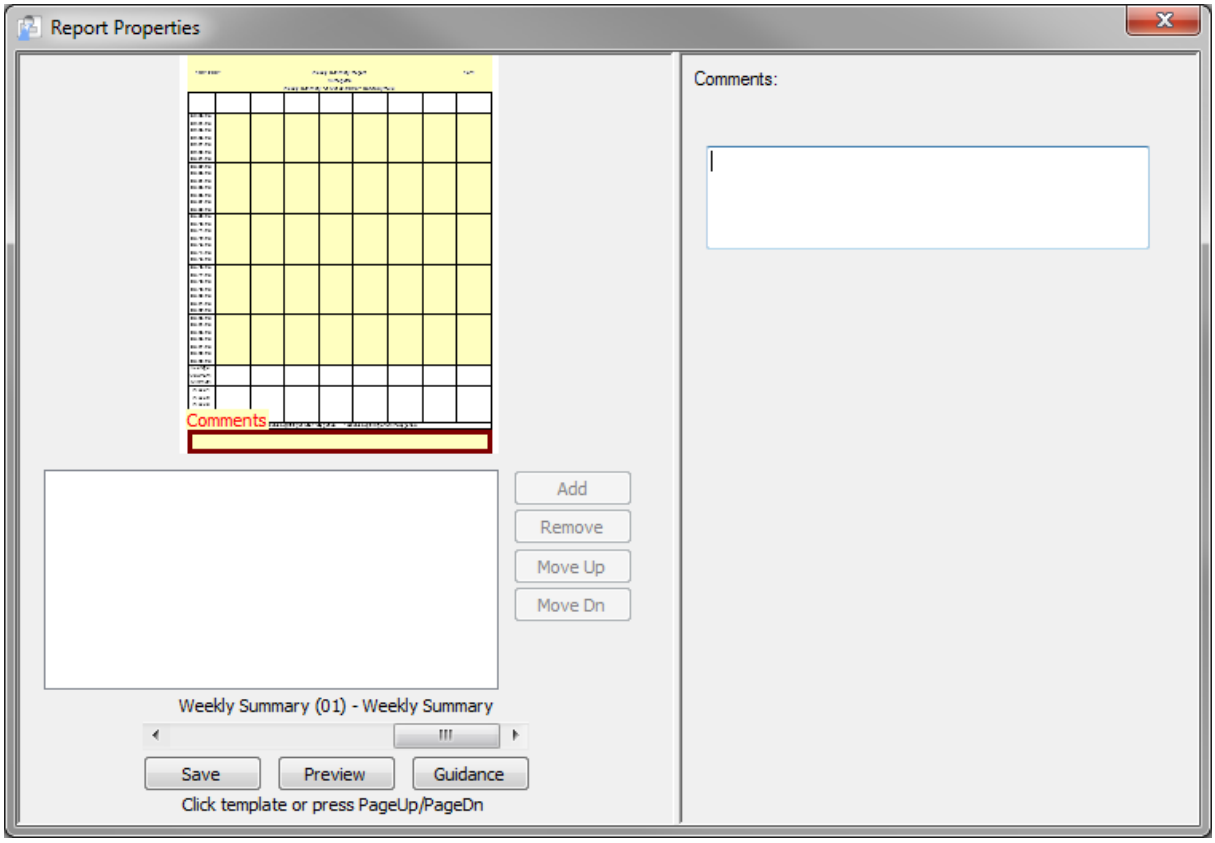
Comments:
Enter the default comments to appear on report at the time of printing. Users can modify these comments at the time of printing if the [ ]Allow Comments checkbox is marked in the General Properties and Settings screen.



9.7.6 Federal DMR Report

The **Federal DMR** (Discharge Monitoring Report, EPA 3320) provides information for Federal EPA and many State reporting requirements.

There are five setup sections:

- General Properties
- General Information
- Rows
- Reporting
- Comments

9.7.6.1 Federal DMR Setup

Topics in this section include:

- General Properties
- General Information
- Rows

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- Reporting
- Comments

9.7.6.1.1 General Properties

In the **General Properties** setup section for the Federal DMR Report, users can edit the following fields:

Page Adjustment and Print settings:

Size (%):
Enter a percentage to which you would like to reduce the printed form.

X Offset:
Adjust the X coordinate to which you would like to offset the printed form.

Y Offset:
Adjust the Y coordinate to which you would like to offset the printed form.

()Plain Paper:
Mark the **()Plain Paper** radio button to print the entire form, including all lines, headers, and data.

()Form:
Mark the **()Form** radio button if you are printing directly on, or will be copying onto a blank form.

Preprinted Form
If generic information is already preprinted on the form, mark the **()Preprinted Form** radio button to print only the data and appropriate information.

[] Verify Comments
To enter comments at the time of printing, check the **[] Verify Comments** checkbox.

[] Verify Exceptions
To review and/or modify reported exceptions at the time of printing, check the **[] Verify Exceptions** checkbox.

Default Text for Rows
Enter the default text that should appear when there is no calculation required or there is no data to be calculated. Fill in the **Sample:**, **Permit:**, and **Units:** fields.

Treat <>~ Data As:
Select from the drop-down menu to determine the method by which data with the less-than (<), greater-than (>) or non-detect (~) data qualifiers will be treated.

Available options are:

- **Preserve Types:** Calculations will preserve the available data qualifiers and calculated results will display the appropriate data qualifier.

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = <3 as the less-than symbol to be preserved for the final calculation

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- **Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using only the numeric entered portion of the data

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = 3 as the less than symbol will be dropped for the final calculation

- **Half Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using one-half the entered value of the data

  Example: results = 3, 6, <2, 1; average = (3+6+1+1)/4 = 2.75 as the less than symbol is dropped and 2 is divided in half for final calculation

- **Zero:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using zero (0) in place of any entered data

  Example: results = 3, 6, <2, 1; average = (3+6+0+1)/4 = 2.5 as the less than symbol is dropped and 0 is used in place of <2 for the final calculation

- **Blank (no data):** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers treating data entered with qualifiers to be seen as blank.

  Example: results = 3, 6, <2, 1; average = (3+6+1)/3 = 3.333 as the less than symbol is dropped and no data is used in place of <2 in the final calculation

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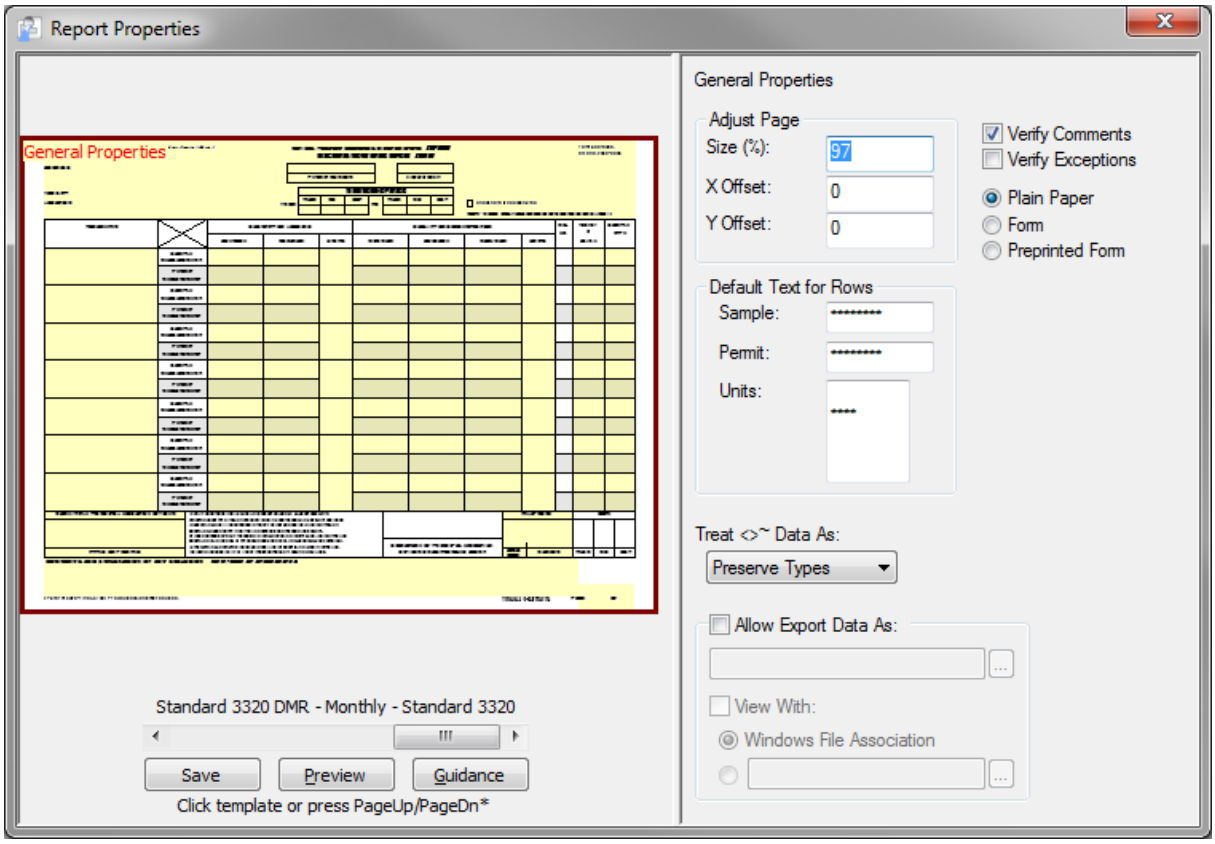

9.7.6.1.2 General Information

In the **General Information** setup section for the Federal DMR Report, users can edit the following fields:

General Information:

Name:
Enter the name of the facility.

Address:
Enter the address of the reported facility. The default address from the selected facility will initially be entered, modify this as necessary.

Facility:
Enter a facility name for the Limit Report. The default facility name will initially be filled in, modify this as necessary.

Location:
Fill in the location field if necessary.

Attn:
Fill in the Attn: field to be displayed on the report.

Permit Number:
Enter the permit number for the reported facility.

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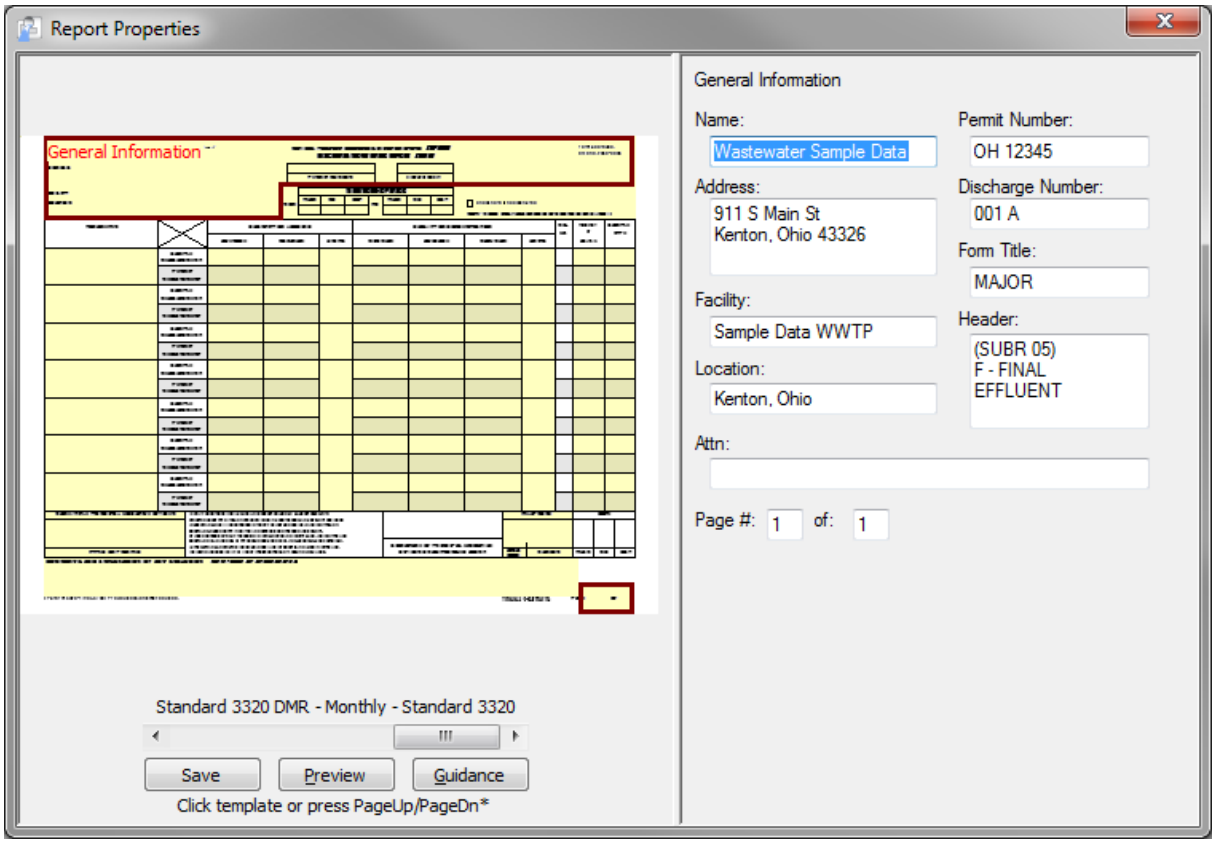
Discharge Number:
Enter the discharge number for the reported facility.

Form Title:
Enter a form title to be displayed on the report.

Header:
Enter up to 4 (four) lines of text to be used as a header for the DMR.

Page # of #
Enter the starting page # and the final page #.



9.7.6.1.3 Rows

Report Rows

The report contains 7 rows available for reporting different location:parameters per page. Each row has 9 setup sections.

- Parameter
- Quantity or Loading, Row x Avg
- Quantity or Loading, Row x Max
- Quantity or Loading, row x Units
- Quality or Concentration, row x Min

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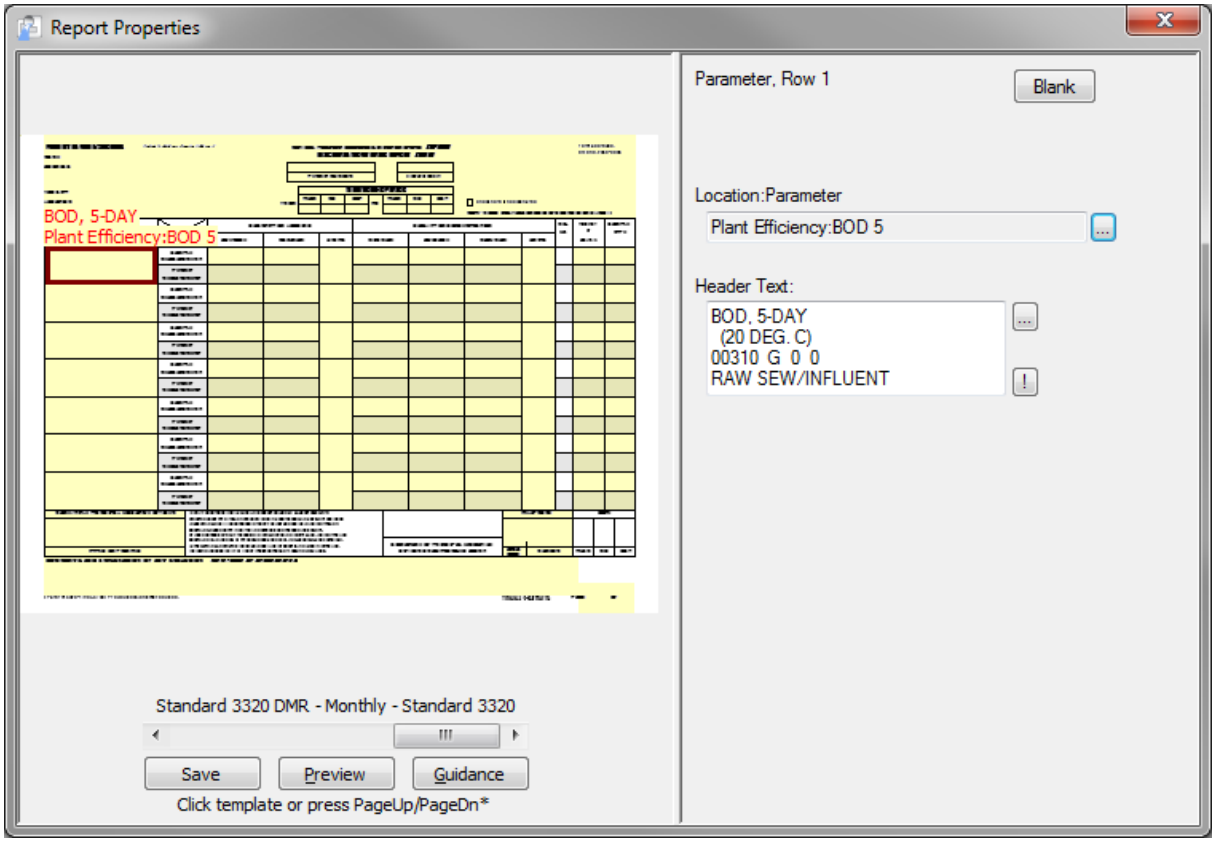
- Quality or Concentration, row x Avg
- Quality or Concentration, row x Max
- Quality or Concentration, row x Units
- Frequency/Sample Type, row x



9.7.6.1.3.1 Parameter

For each row to be reported on the Federal DMR follow these directions.

Row Setup: Parameter

Location:Parameter:
Press the **[...]** button next to the **Location:Parameter** field. This will display the Location:Parameter picklist, select the desired Location:Parameter to be reported, and press **[Select]**.

Header Text:
In the **Header Text:** field, a default header will be displayed for recognized Location:Parameters. If there is no header or if the default header is not correct simply modify the information in the field. To see the available headers for recognized Location:Parameters, press the **[...]** button. Find the desired header text in the picklist and press **[Select]**. To automatically refresh the header, or to reset it to the default, press the **[!]** button.

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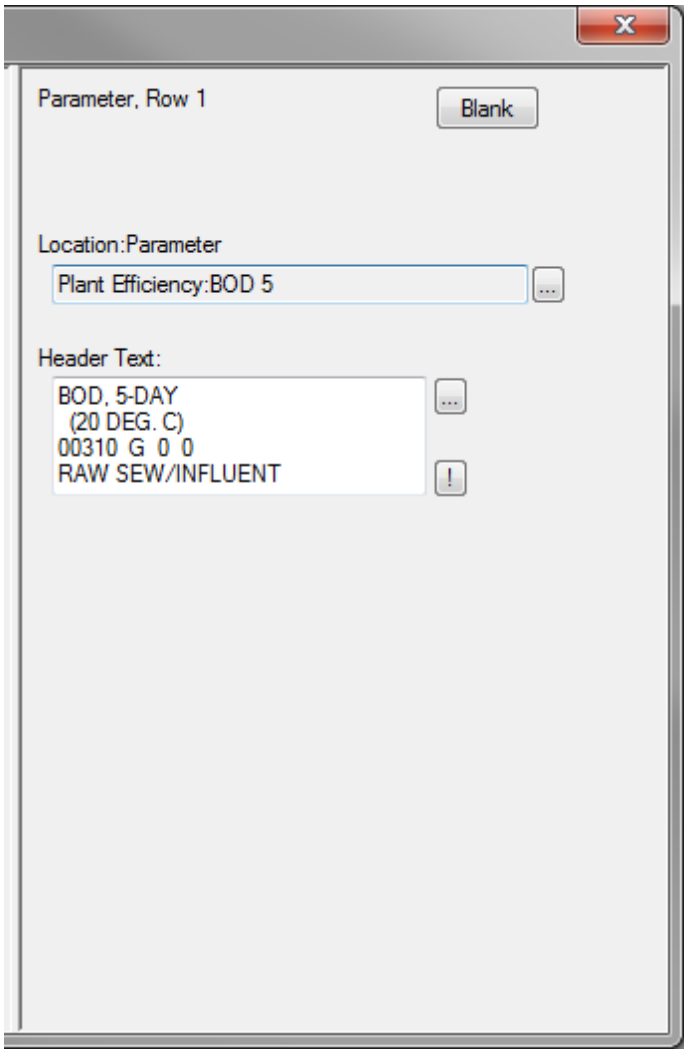

9.7.6.1.3.2 Loading

Two fields, Average and Maximum, for the calculation of loadings are available, the process is exactly the same for both the Average and Maximum fields.

Row Setup: Loading

Average/Maximum:

Press the **[...]** button to select the desired calculation type for the selected report. The available calculations are reviewed on the Calculations help file page.

Select the type of data to be reported:

- **() value**
- **() kg/loading**
- **() g/day loading**

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- **() lb/day loading**

Permit:

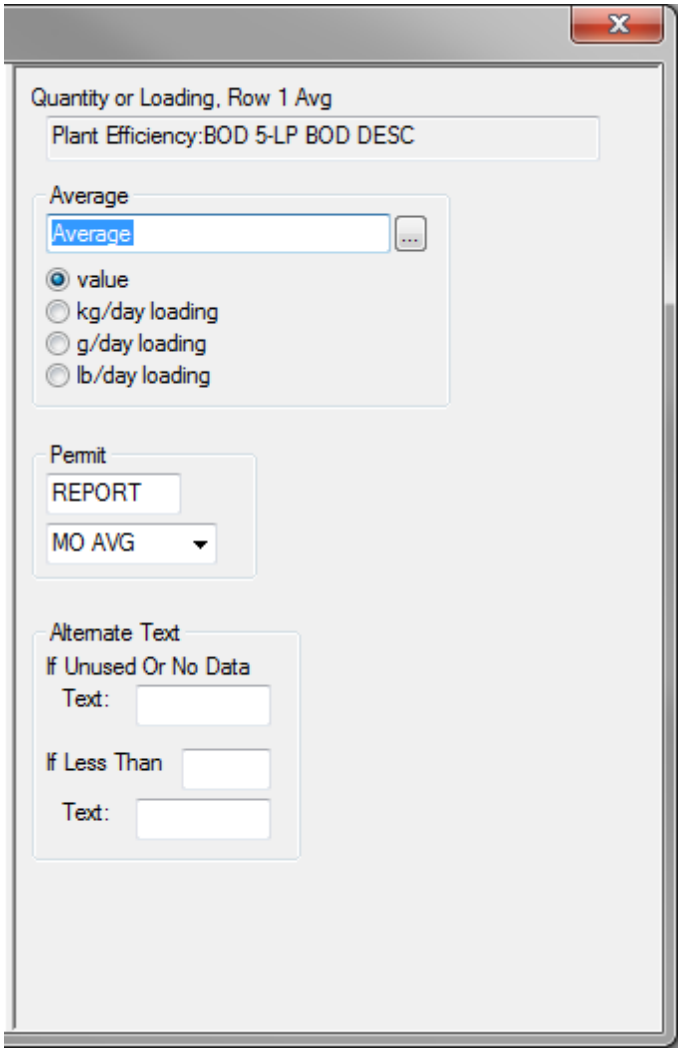
Enter the permitted limit into the first field in the **Permit** area. This number can be alpha or numeric based. If numeric, the calculated value will be compared to the value entered and an exception, if found, will be reported.

In the dropdown list box, select a description for the type of calculation that is reported for the row.

Alternate Text:

In the event that there is no data or the field is unused, enter text to be displayed. The default will be entered as set in the Federal DMR General Properties settings.

Additionally, if a detection limit is needed and if the calculated value is below the detection limit, alternate text should be shown, enter the comparison value in the **If Less Than** field and the alternate text into the **Text:** field.



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9.7.6.1.3.3 Concentration

Three fields, Minimum, Average and Maximum, for the calculation of concentrations are available, the process is exactly the same for both the Minimum, Average and Maximum fields.

Row Setup: Concentration

Minimum/Average/Maximum:

Press the **[...]** button to select the desired calculation type for the selected report. The available calculations are reviewed on the Calculations help file page.

Permit:

Enter the permitted limit into the first field in the **Permit** area. This number can be alpha or numeric based. If numeric, the calculated value will be compared to the value entered and an exception, if found, will be reported.

In the dropdown list box, select a description for the type of calculation that is reported for the row.

Alternate Text:

In the event that there is no data or the field is unused, enter text to be displayed. The default will be entered as set in the Federal DMR General Properties settings.

Additionally, if a detection limit is needed and if the calculated value is below the detection limit, alternate text should be shown, enter the comparison value in the **If Less Than** field and the alternate text into the **Text:** field.

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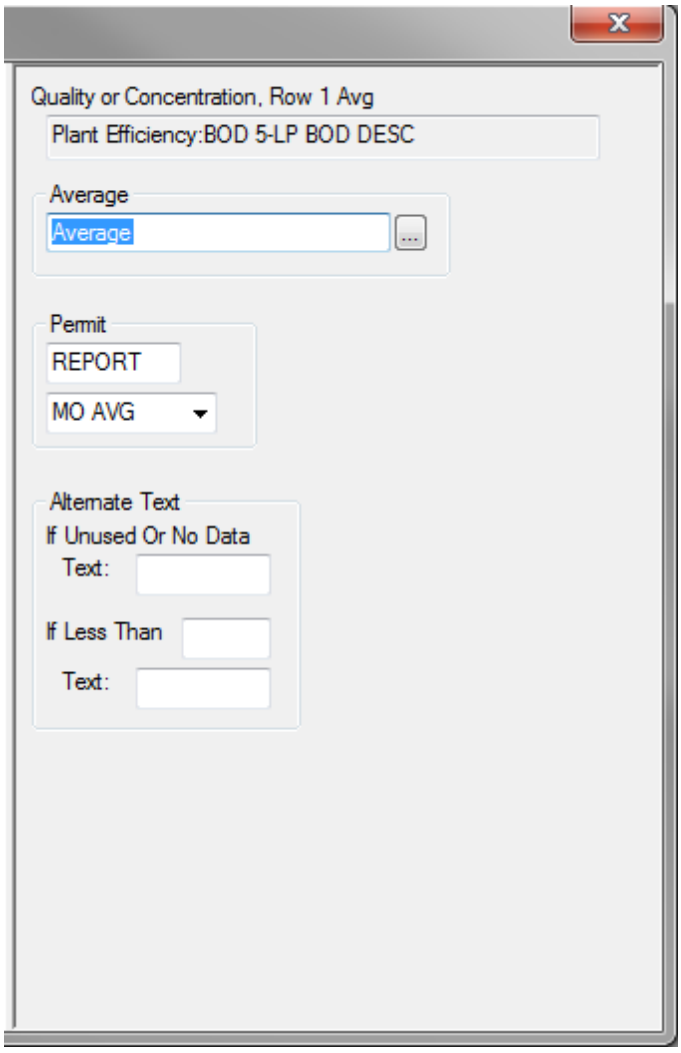

9.7.6.1.3.4 Units

For both the loadings and concentrations, decimal precision and units can be edited.

Row Setup: Units

Decimal Precision

In the **Decimal** field, enter the desired precision for the loadings or concentration values.

Units

In the **Units** area, a default unit, based on the Parameter selected will be displayed. Modify the units directly or select from a list of commonly used units, by pressing the **[V]** dropdown list box to the right of the field.

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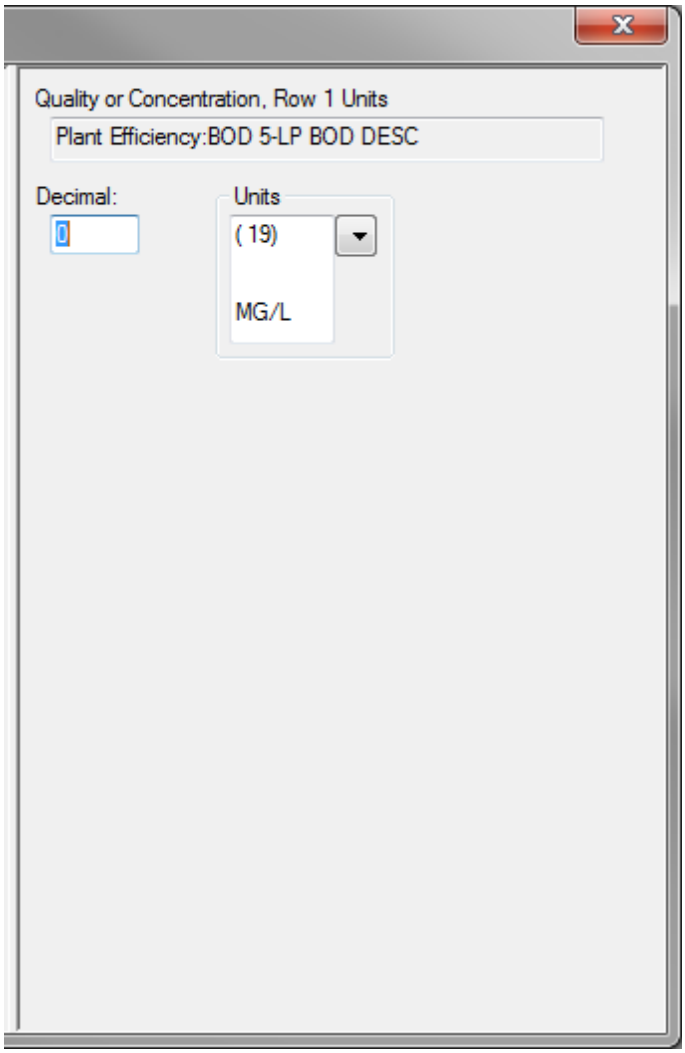

9.7.6.1.3.5 Frequency/Sample Type

Each row of the Federal DMR report contains setup information required to define the Frequency of Analysis and Sample Type.

Row Setup: Frequency of Analysis / Sample Type

Frequency

In the **Frequency** area, enter the **Sample Measurement** by entering directly into the field or selecting from a list of common measurements.

> ***NOTE:*** To allow the Operator10 - Wastewater report to automatically calculate the number of samples, select or enter a ~ (tilde) character.

Enter the **Permit Requirement** or select from common requirements in the dropdown list box.

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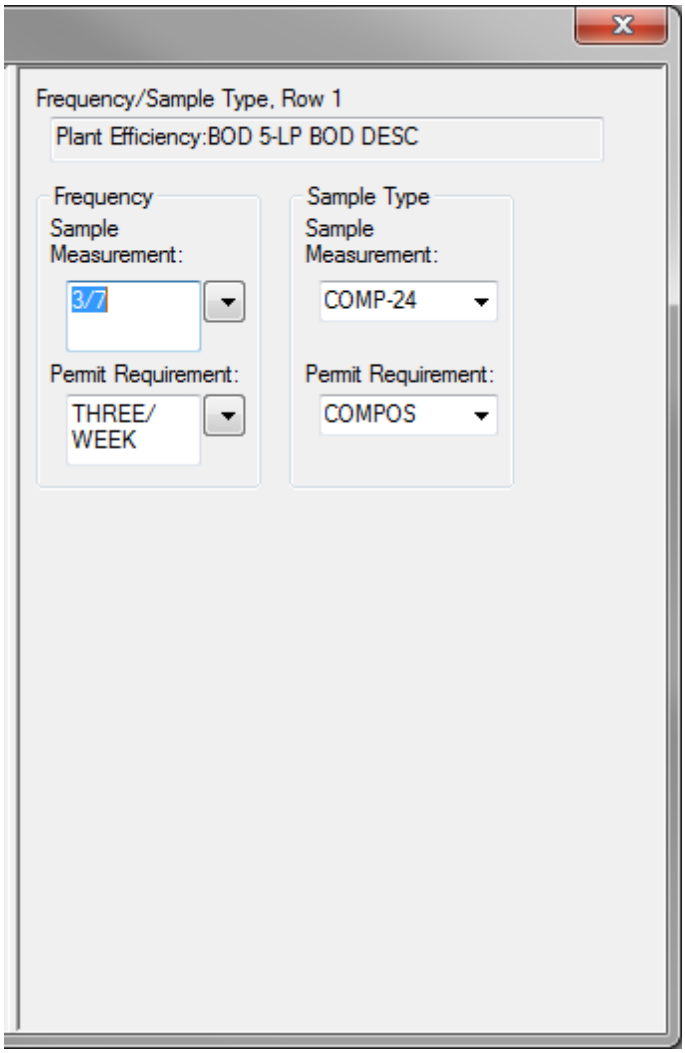
Sample Type

In the **Sample Type** area enter or select the **Sample Measurement** from the dropdown list box.

Enter or select the **Permit Requirement** from the dropdown list box.

The dropdown list boxes contain common measurements available for quick selection.



9.7.6.1.4 Reporting

Use the **Reporting** section to modify the information that should appear each time the report is printed.

Reporting

No Discharge []
To place a check in the **No Discharge** checkbox on the printed report, place a check in the checkbox.

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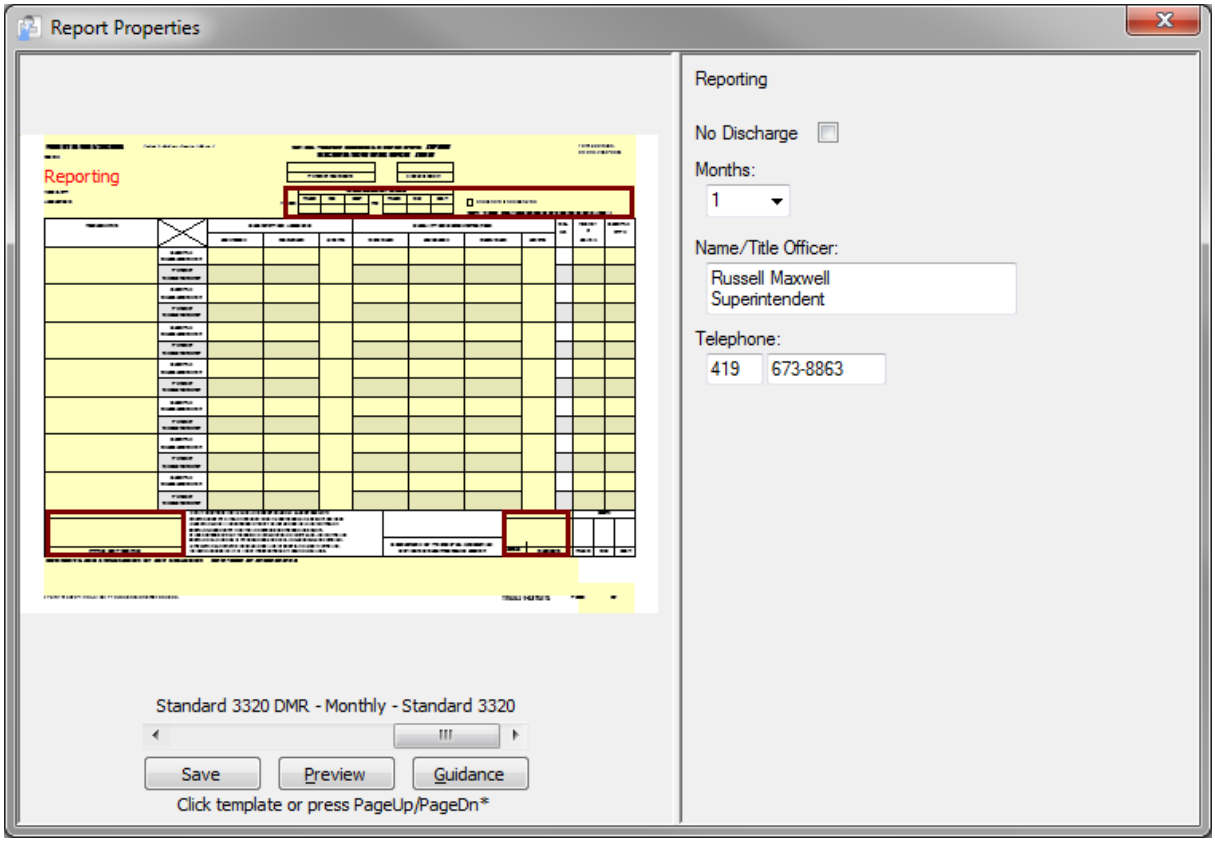
Months:
To modify the number of months to be used for reporting and calculation purposes, select a number of months from the dropdown list box.

Name/Title Officer:
Enter the name and title of the official responsible for report submission.

Telephone:
Enter the telephone number of the contact person responsible for report submission.



9.7.6.1.5 Comments

In the **Comments** setup section for the Federal DMR Report, users can edit the following fields:

Comments:

Comments:
Enter the default comments to appear on report at the time of printing. Users can modify these comments at the time of printing if the **[] Verify Comments** checkbox is marked in the General Properties screen.

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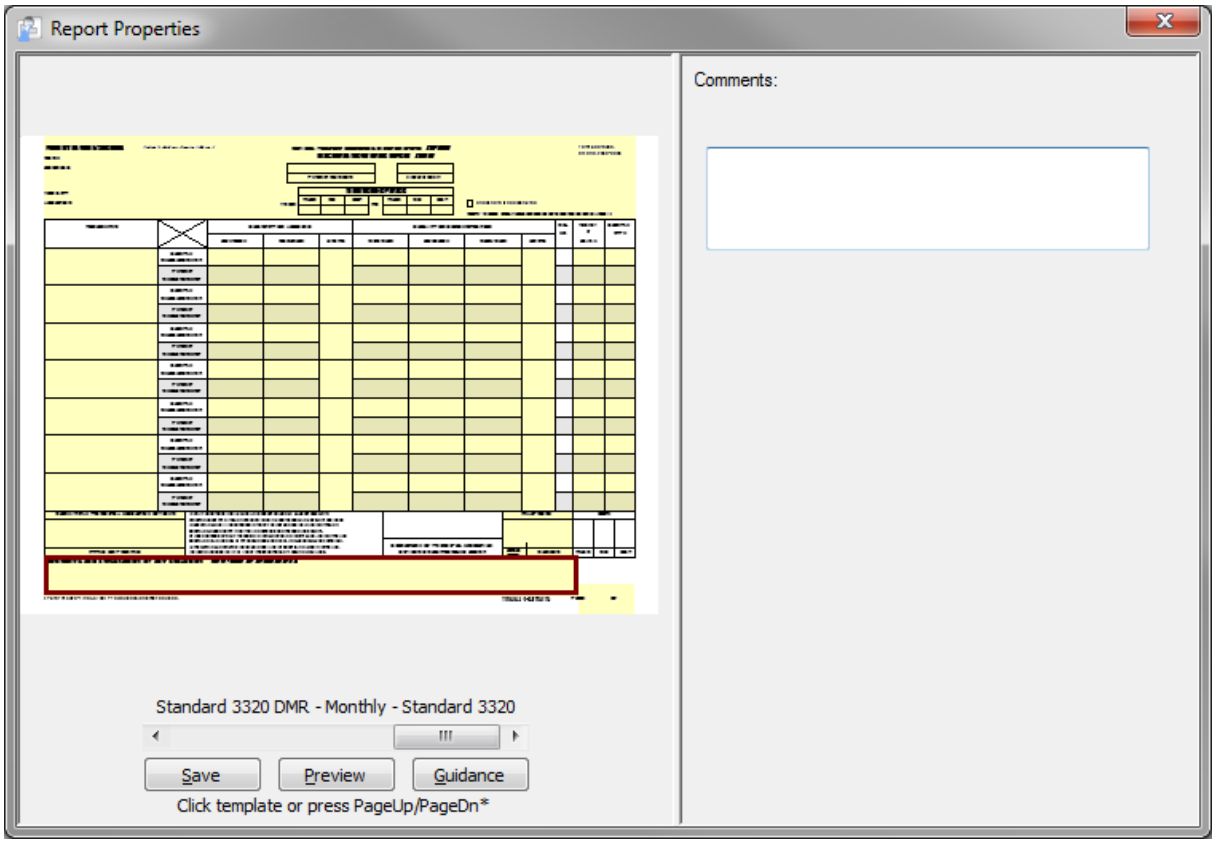

9.7.7 BioSolids Reports

Topics in this section include:

- BioSolids Application List Report
- BioSolids Nutrient Report
- BioSolids Limit Report

9.7.7.1 BioSolids Application List Report

Bio App List Report

The **Bio App List Report** (BioSolids Application List Report) allows users to review all applications of Biosolids for up to a 12 month period. The application list report can be sorted by **Date** of application, **Biosolid** type applied, or **Site** of application.

There are 3 sections of the report that can be setup:

- General Properties
- General Information
- Comments

9.7.7.1.1 BioSolids Application List - General Properties

General Properties

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In the General Properties section of the Bio App List Report users can modify several options, including:

Page Adjustment and Print settings:

Size (%):
Enter a percentage to which you would like to reduce the printed form.

X Offset:
Adjust the X coordinate to which you would like to offset the printed form.

Y Offset:
Adjust the Y coordinate to which you would like to offset the printed form.

[]Allow Comments
Place a check in this checkbox to verify/enter comments at the time of printing the Bio App List Report

Order By:

Date:
Select this option to sort the App List Report by the **Date** of Biosolid application.

Biosolid:
Select this option to sort the App List Report by the **Biosolid** applied to the sites.

Site:
Select this option to sort the App List Report by the **Site** of Biosolid application.

Months Reported
Choose a number of months to be reported on the Biosolid App List Report. Select a number from the dropdown list box.

Decimal Precision
Enter a value into the **Decimal Precision** field to indicate the number of decimals to be shown.

Treat <>~ Data As:
Select from the drop-down menu to determine the method by which data with the less-than (<), greater-than (>) or non-detect (~) data qualifiers will be treated.

Available options are:

- **Preserve Types:** Calculations will preserve the available data qualifiers and calculated results will display the appropriate data qualifier.

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = <3 as the less-than symbol to be preserved for the final calculation

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- **Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using only the numeric entered portion of the data

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = 3 as the less than symbol will be dropped for the final calculation

- **Half Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using one-half the entered value of the data

  Example: results = 3, 6, <2, 1; average = (3+6+1+1)/4 = 2.75 as the less than symbol is dropped and 2 is divided in half for final calculation

- **Zero:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using zero (0) in place of any entered data

  Example: results = 3, 6, <2, 1; average = (3+6+0+1)/4 = 2.5 as the less than symbol is dropped and 0 is used in place of <2 for the final calculation

- **Blank (no data):** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers treating data entered with qualifiers to be seen as blank.

  Example: results = 3, 6, <2, 1; average = (3+6+1)/3 = 3.333 as the less than symbol is dropped and no data is used in place of <2 in the final calculation

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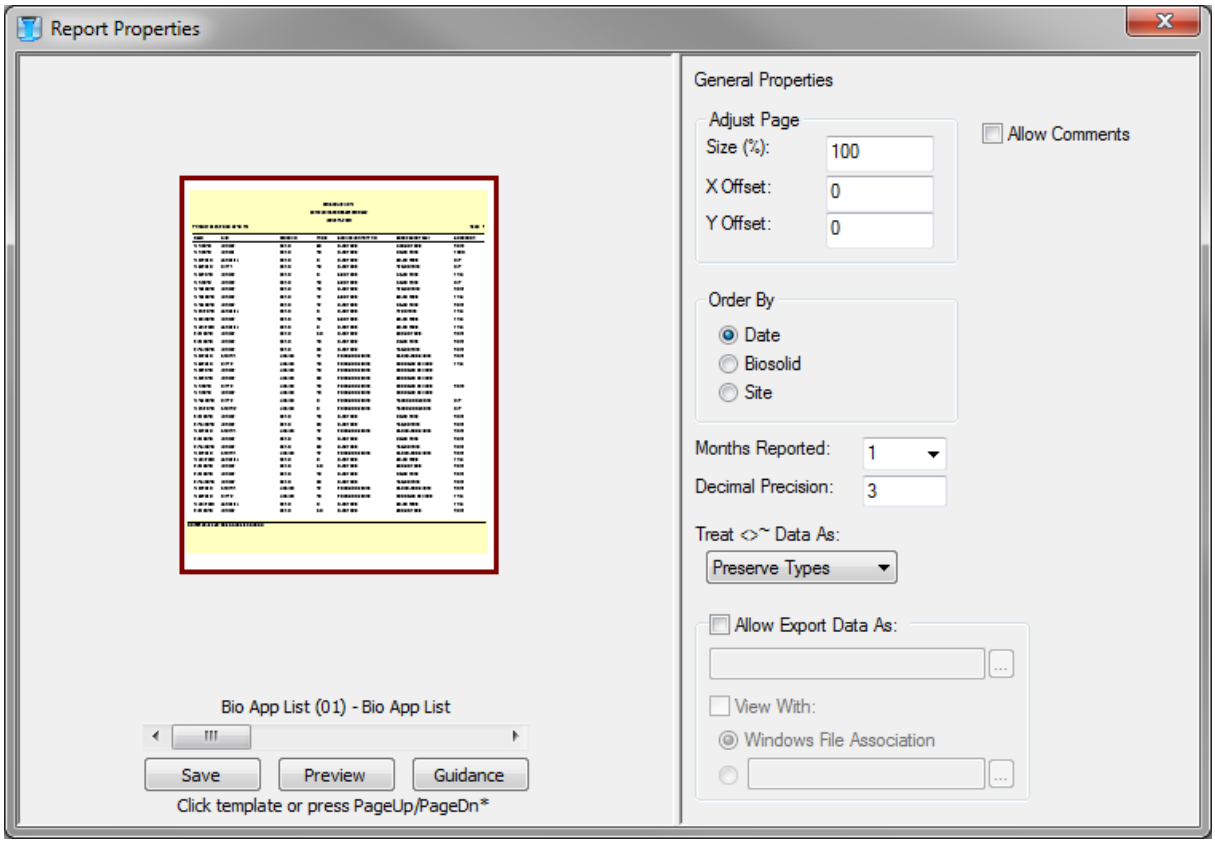

9.7.7.1.2 BioSolids Application List - General Information

General Information

In the General Information section of the Bio App List Report setup:

Report Name:
Enter the desired report name (1 to 40 characters) for the Bio App List Report. This name is different than the report name shown in the Direct Access tree.

Facility:
Enter a facility name for the Bio App List Report. The default facility name will initially be filled in, modify this as necessary.

Beginning Page #:
Enter the beginning page number, if the report is greater than 1 page, Operator10 - Wastewater will continue the numbering sequence. Leave this field blank if you simply want to start at page number 1.

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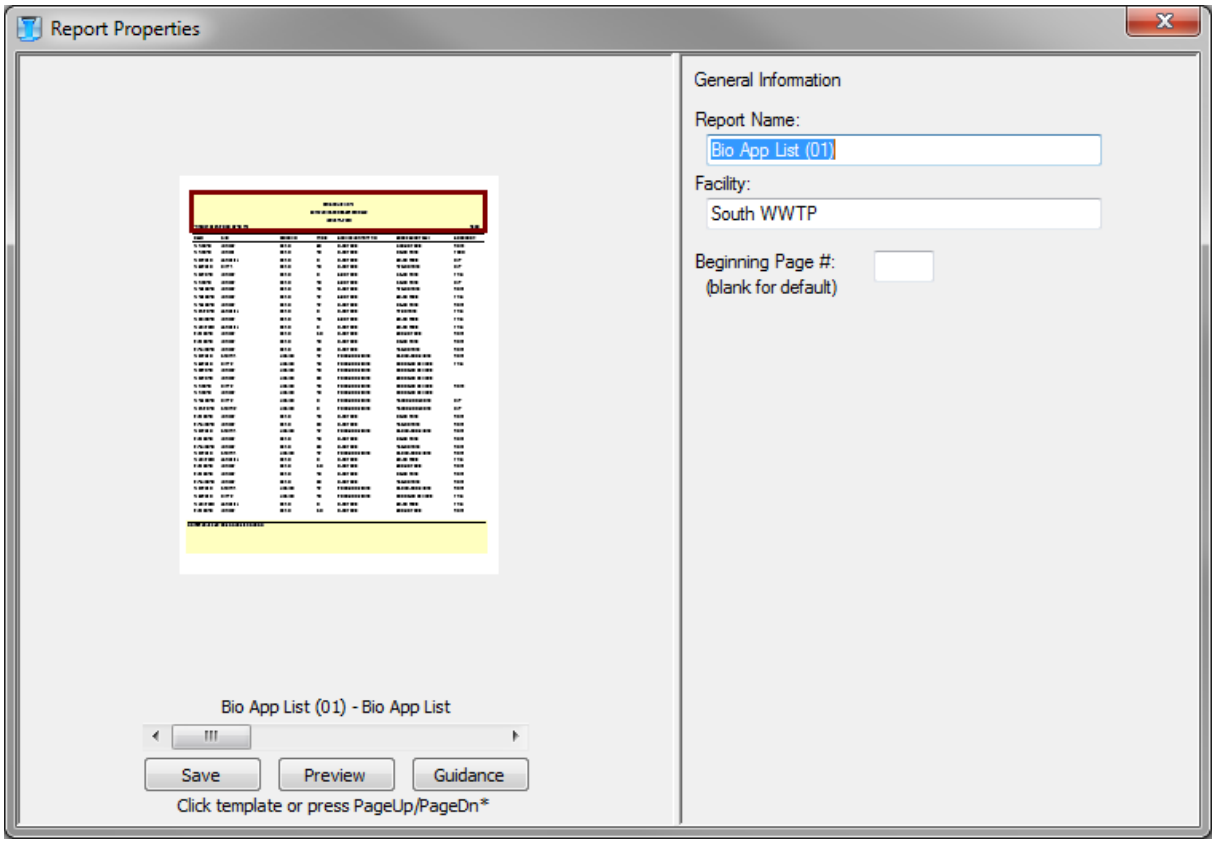

9.7.7.1.3 BioSolids Application List - Comments

Comments

Enter default comments to be displayed on the printed report, if the **[]Allow Comments** checkbox is checked in the General Properties section, users can edit these comments when printed.

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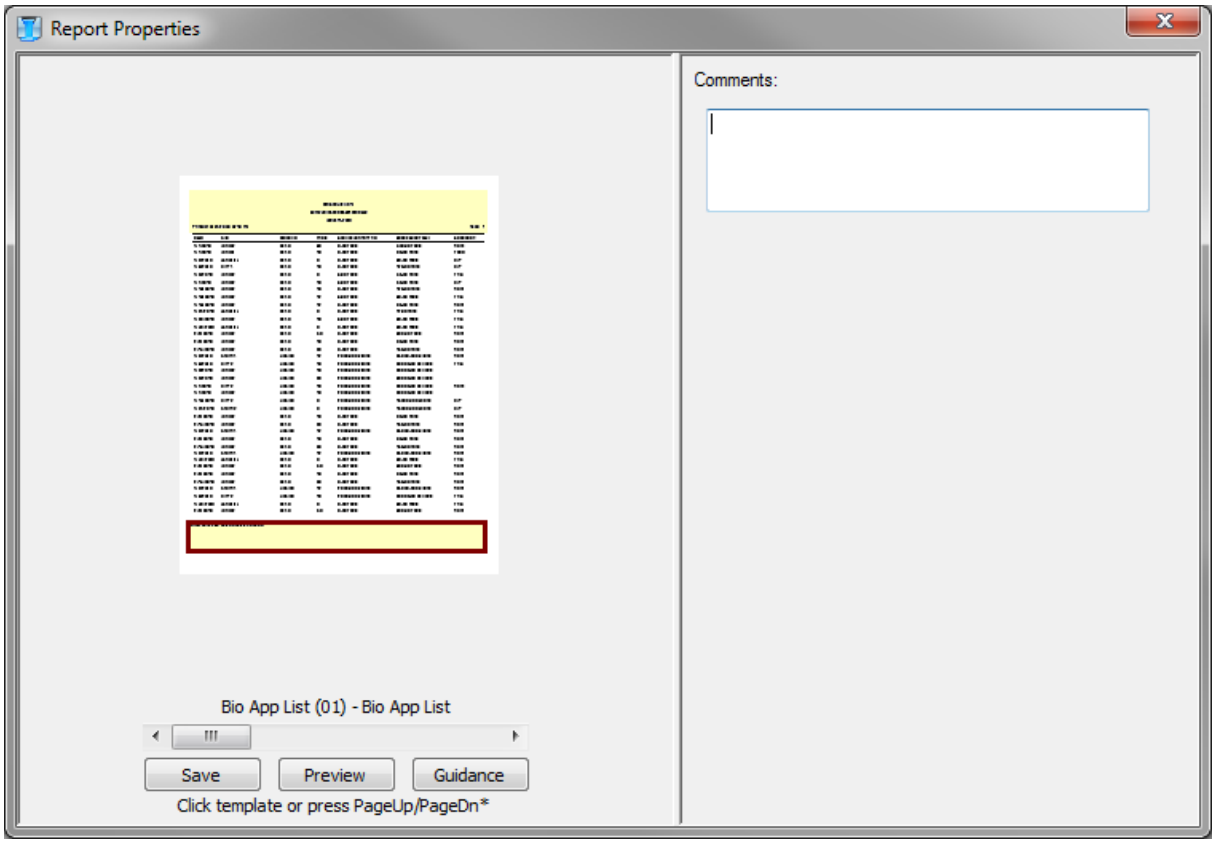

9.7.7.2 BioSolids Nutrient Report

Bio Nutrient Report

The **BioSolids Nutrient Report** allow users who have created a Biosolids-type facility, to review the defined nutrients of Biosolid sites. Users can add as many or as few sites to the report.

The Bio Nutrient report generally shows the defined nutrients along with their levels and their applied values.

There are 5 sections of the reports that can be setup for each report are:

- General Properties
- General Information
- Site
- Reporting Inclusions (Bio Nutrient Report)
- Comments

9.7.7.2.1 BioSolids Nutrient Report - General Properties

General Properties

In the General Properties section of the Bio Nutrient Report users can modify several options, including:

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Page Adjustment and Print settings:

Size (%):
Enter a percentage to which you would like to reduce the printed form.

X Offset:
Adjust the X coordinate to which you would like to offset the printed form.

Y Offset:
Adjust the Y coordinate to which you would like to offset the printed form.

[]Allow Remarks
Place a check in this checkbox to verify/enter comments at the time of printing the Bio Nutrient Report

Treat <>~ Data As:
Select from the drop-down menu to determine the method by which data with the less-than (<), greater-than (>) or non-detect (~) data qualifiers will be treated.

Available options are:

- **Preserve Types:** Calculations will preserve the available data qualifiers and calculated results will display the appropriate data qualifier.

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = <3 as the less-than symbol to be preserved for the final calculation

- **Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using only the numeric entered portion of the data

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = 3 as the less than symbol will be dropped for the final calculation

- **Half Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using one-half the entered value of the data

  Example: results = 3, 6, <2, 1; average = (3+6+1+1)/4 = 2.75 as the less than symbol is dropped and 2 is divided in half for final calculation

- **Zero:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using zero (0) in place of any entered data

  Example: results = 3, 6, <2, 1; average = (3+6+0+1)/4 = 2.5 as the less than symbol is dropped and 0 is used in place of <2 for the final calculation

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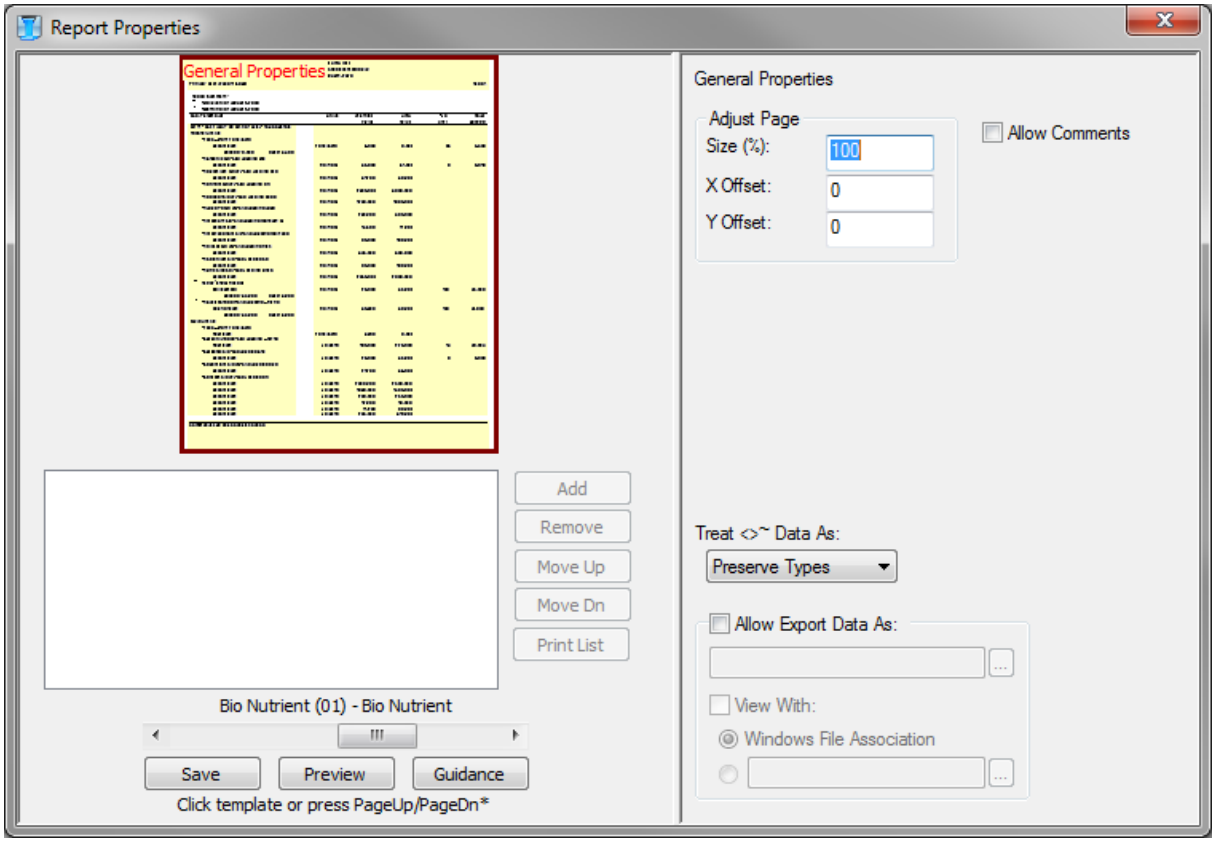
- **Blank (no data):** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers treating data entered with qualifiers to be seen as blank.

  Example: results = 3, 6, <2, 1; average = (3+6+1)/3 = 3.333 as the less than symbol is dropped and no data is used in place of <2 in the final calculation



9.7.7.2.2 BioSolids Nutrient Report - General Information

General Information

In the General Properties section of the Bio Nutrient Report setup:

Report Name:
Enter the desired report name (1 to 40 characters) for the Bio Nutrient Report. This name is different than the report name shown in the Direct Access tree.

Facility:
Enter a facility name for the Bio Nutrient Report. The default facility name will initially be filled in, modify this as necessary.

Beginning Page #:
Enter the beginning page number, if the report is greater than 1 page, Operator10 will continue the numbering sequence. Leave this field blank if you simply want to start at page number 1.

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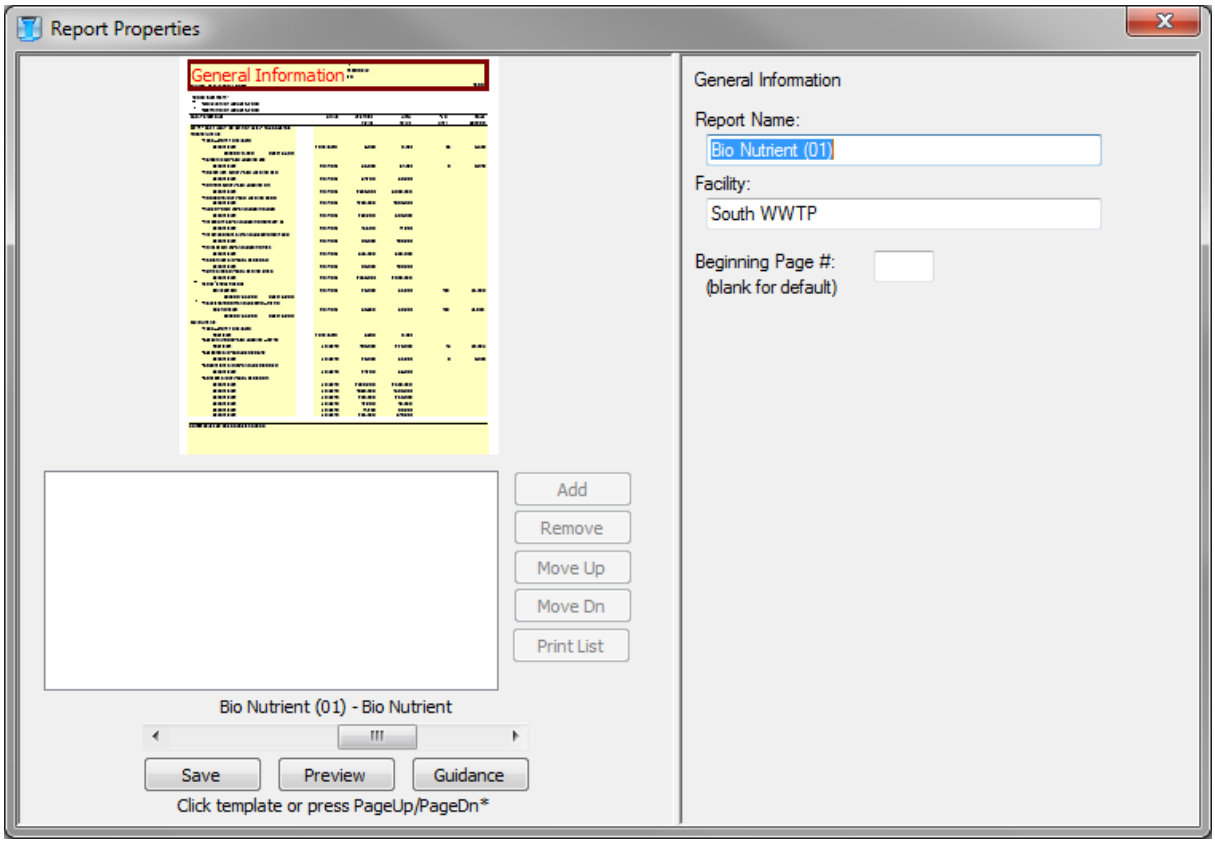

9.7.7.2.3 BioSolids Nutrient Report - Sites

Site

Each Nutrient report that is created can contain a number of Biosolid sites for which values can be reported. Follow these instructions to add sites to the report.

1. Press the **[Add]** button in the left pane of the Report Properties window, in the Location picklist that appears, select the Biosolid application site to be reported. Once selected, press the **[Select]** button.
2. Once the site has been added, brief information about that site will be visible in the right pane of the window.
3. To change sites once it has been added, press the **[...]** button.

[Remove]
Press the [Remove] button to remove the selected Site from the report.

[Move Up/Dn]
To reorder the sites to be reported, highlight a site in the list and press the [Move Up] or [Move Dn] button.

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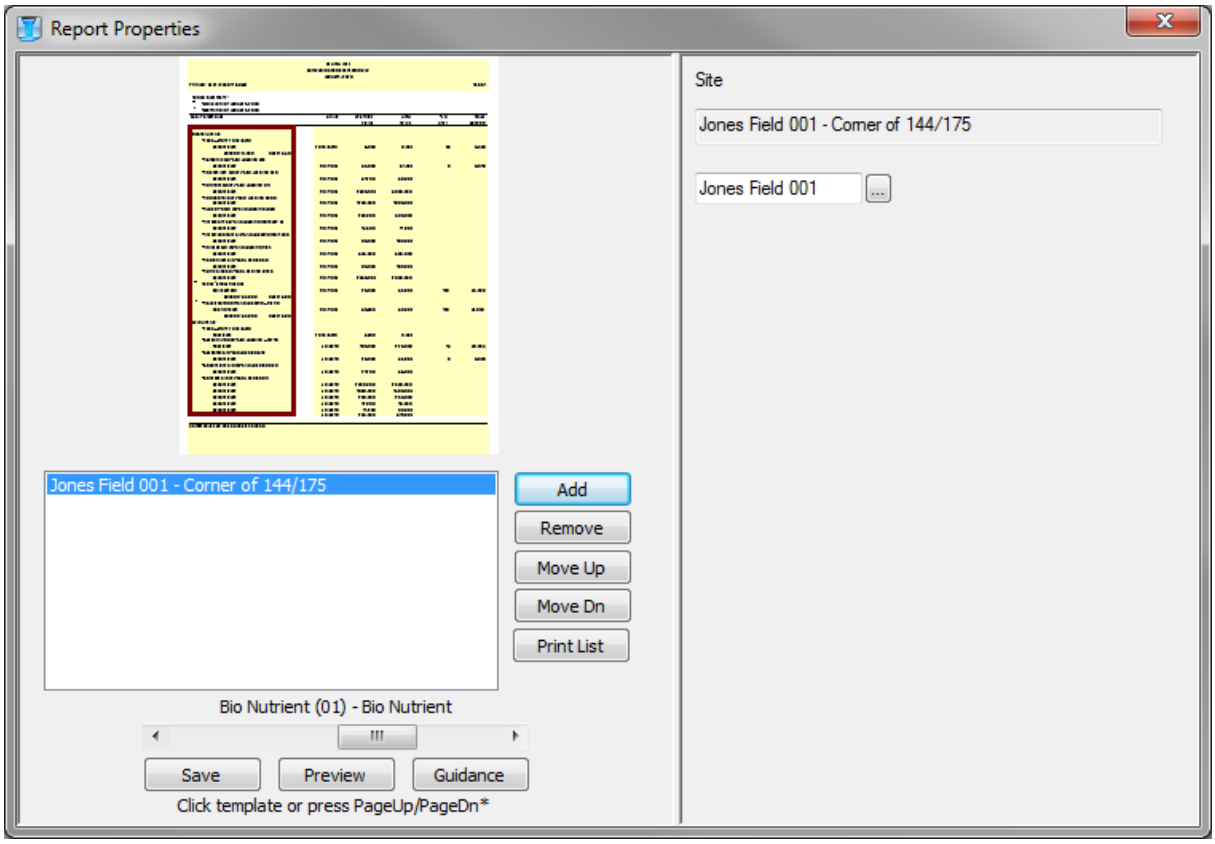

9.7.7.2.4 BioSolids Nutrient Report - Report Inclusions

Reporting Inclusions (Bio Nutrient Report)

Place a check or select an available option from the options on the right pane of the Report Properties window.

For additional help regarding the information to be included, see the Biosolid Nutrients section of the Main Help file.

Limit Type - Choose from the available Limit Types to be shown

- **[]Accum Sum**
- **[]Year Sum**
- **[]Month Sum**
- **[]Soil Sample**
- **[]Quarter Sum**

Not In Service - Select an option regarding the display of sites that are marked as Not In Service.

- **()Include**
- **()Status Only**
- **()Ignore**

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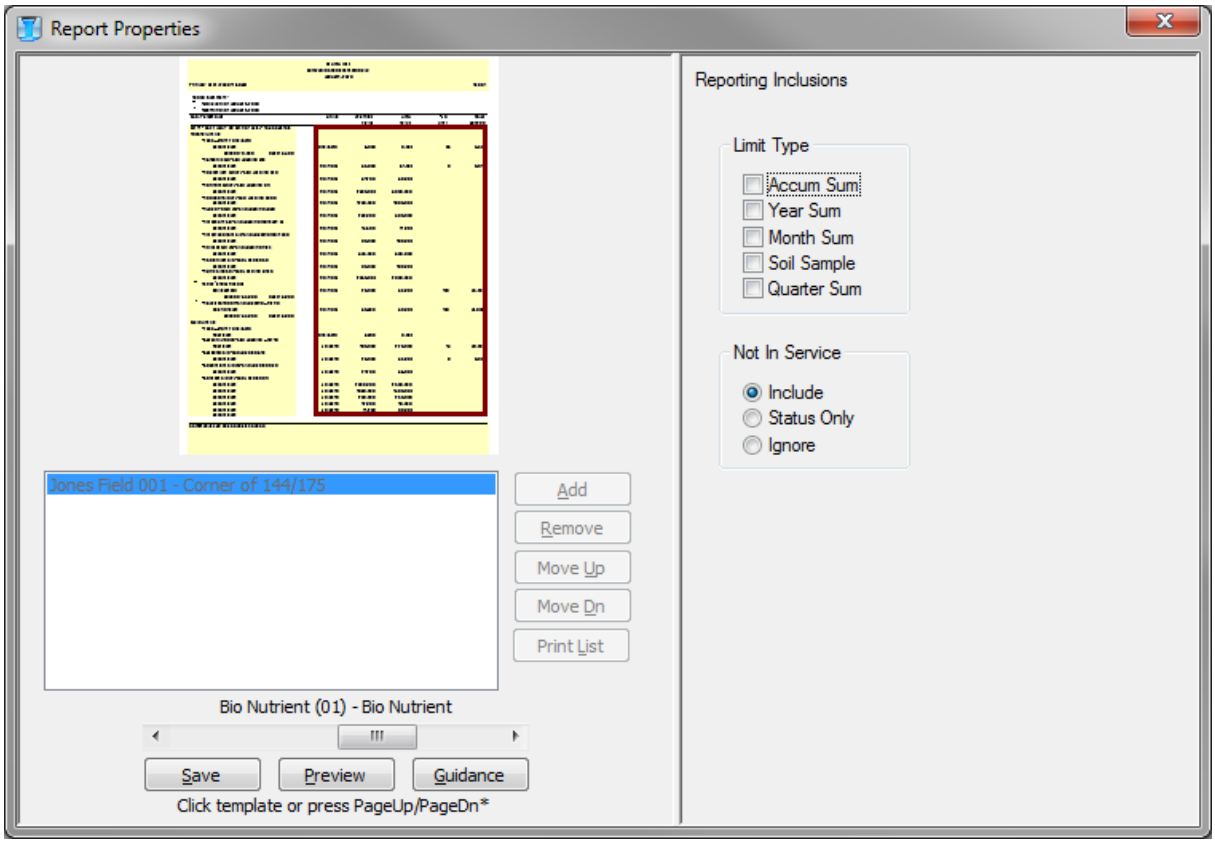

9.7.7.2.5 BioSolids Nutrient Report - Comments

Comments:

Enter default comments to be displayed on the printed report, if the **[]Allow Comments** checkbox is checked in the General Properties section, users can edit these comments when printed.

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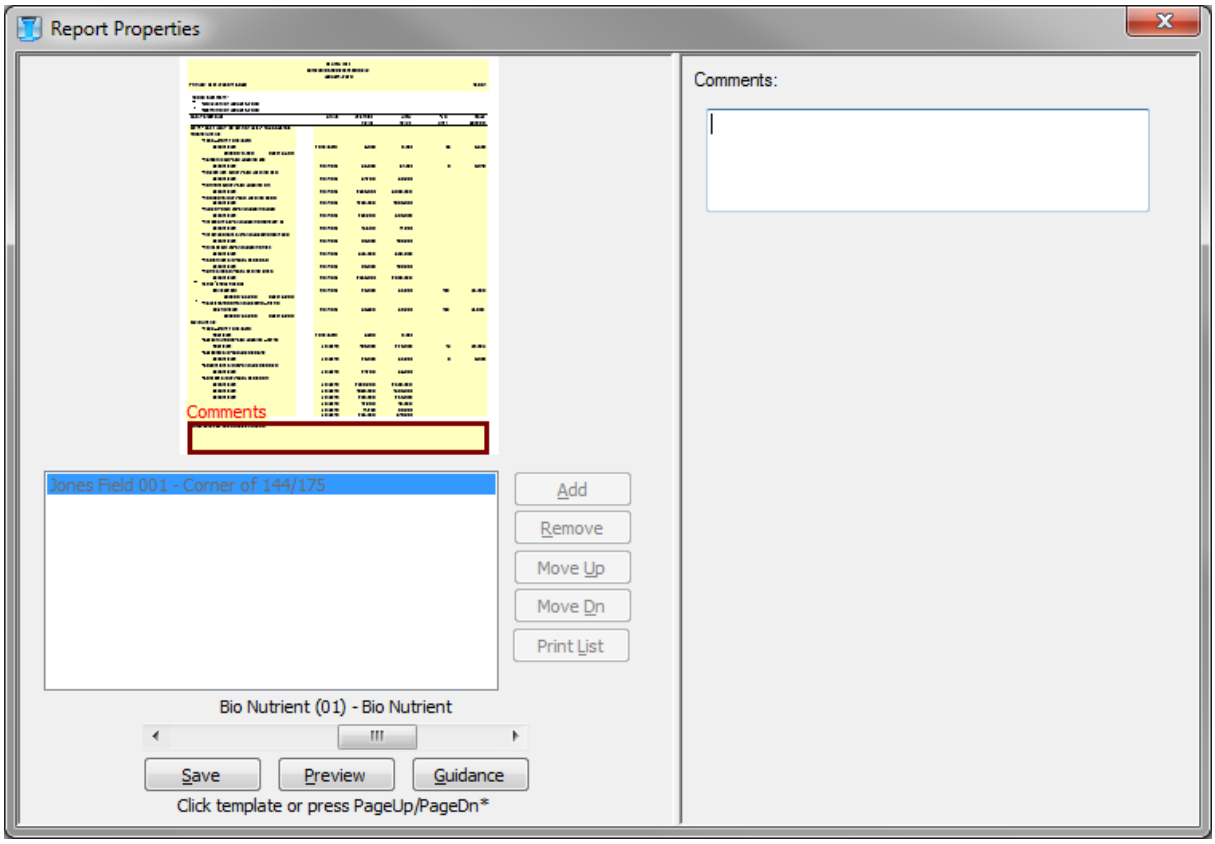

9.7.7.3 BioSolids Limit Report

Bio Limit Report

The **BioSolids Limit Report** allow users who have created a Biosolids-type facility, to review the defined limits of Biosolid sites. Users can add as many or as few sites to the report.

The Bio Limit report generally shows the defined limits or warning levels of the identified parameters applied to the selected sites.

There are 5 sections of the reports that can be setup for each report are:

- General Properties
- General Information
- Site
- Reporting Inclusions (Bio Nutrient Report)
- Comments

9.7.7.3.1 BioSolids Limit Report - General Properties

General Properties

In the General Properties section of the Bio Limit Report users can modify several options, including:

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Page Adjustment and Print settings:

Size (%):
Enter a percentage to which you would like to reduce the printed form.

X Offset:
Adjust the X coordinate to which you would like to offset the printed form.

Y Offset:
Adjust the Y coordinate to which you would like to offset the printed form.

[]Allow Comments
Place a check in this checkbox to verify/enter comments at the time of printing the Bio Limit Report

Treat <>~ Data As:
Select from the drop-down menu to determine the method by which data with the less-than (<), greater-than (>) or non-detect (~) data qualifiers will be treated.

Available options are:

- **Preserve Types:** Calculations will preserve the available data qualifiers and calculated results will display the appropriate data qualifier.

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = <3 as the less-than symbol to be preserved for the final calculation

- **Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using only the numeric entered portion of the data

  Example: results = 3, 6, <2, 1; average = (3+6+2+1)/4 = 3 as the less than symbol will be dropped for the final calculation

- **Half Entered Value:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using one-half the entered value of the data

  Example: results = 3, 6, <2, 1; average = (3+6+1+1)/4 = 2.75 as the less than symbol is dropped and 2 is divided in half for final calculation

- **Zero:** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers using zero (0) in place of any entered data

  Example: results = 3, 6, <2, 1; average = (3+6+0+1)/4 = 2.5 as the less than symbol is dropped and 0 is used in place of <2 for the final calculation

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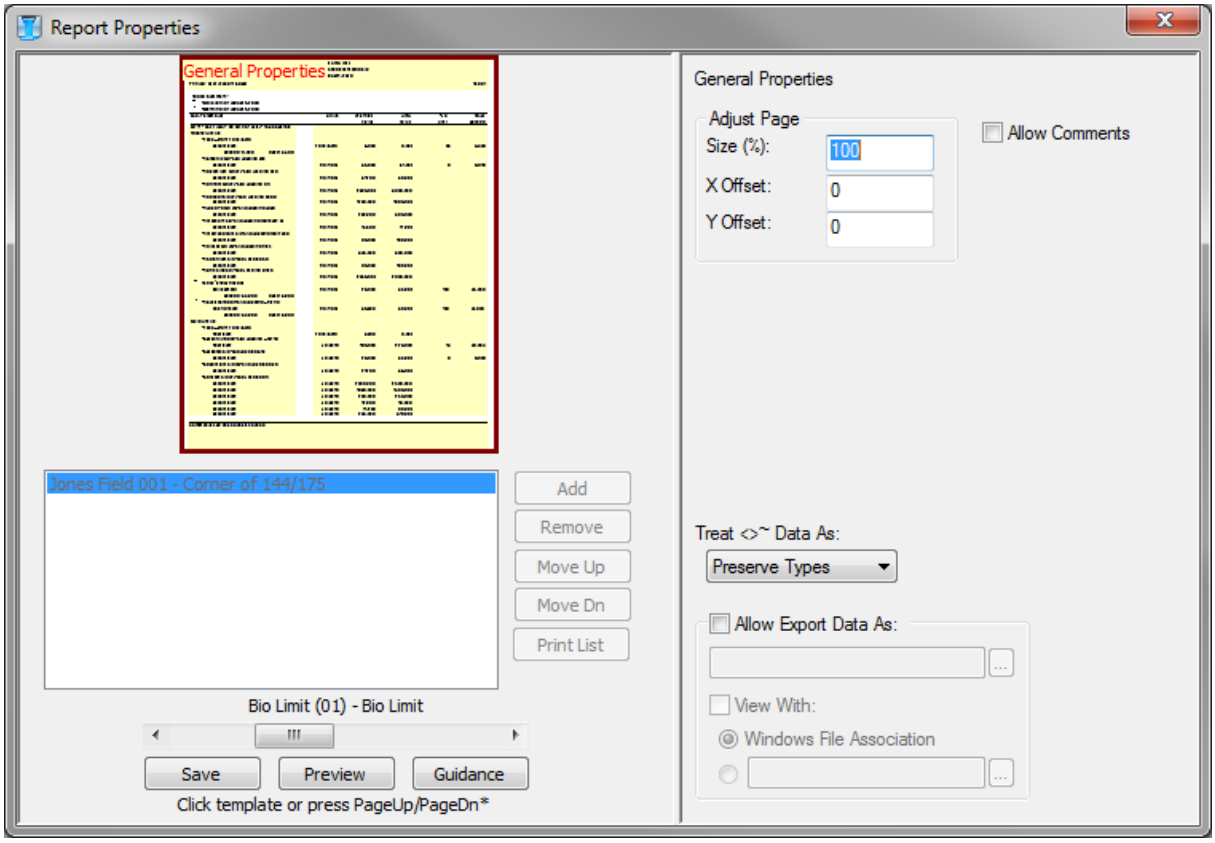
- **Blank (no data):** Calculations will drop the data qualifiers from data and calculated results will display without the qualifiers treating data entered with qualifiers to be seen as blank.

  Example: results = 3, 6, <2, 1; average = (3+6+1)/3 = 3.333 as the less than symbol is dropped and no data is used in place of <2 in the final calculation



9.7.7.3.2 BioSolids Limit Report - General Information

General Information

In the General Properties section of the Bio Limit Report setup:

Report Name:
Enter the desired report name (1 to 40 characters) for the Bio Limit Report. This name is different than the report name shown in the Direct Access tree.

Facility:
Enter a facility name for the Bio Limit Report. The default facility name will initially be filled in, modify this as necessary.

Beginning Page #:
Enter the beginning page number, if the report is greater than 1 page, Operator10 will continue the numbering sequence. Leave this field blank if you simply want to start at page number 1.

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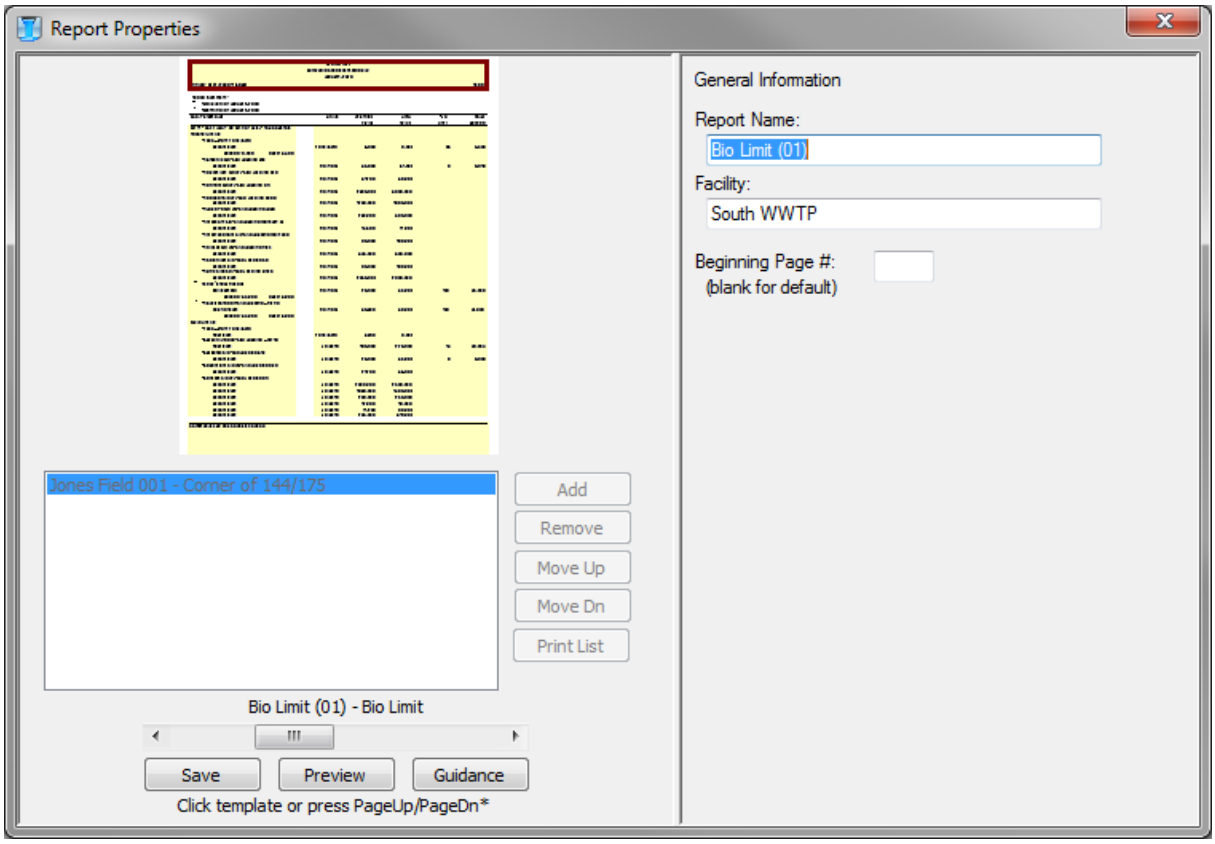

9.7.7.3.3 BioSolids Limit Report - Sites

Site

Each Limit report that is created can contain a number of Biosolid sites for which values can be reported. Follow these instructions to add sites to the report.

1. Press the **[Add]** button in the left pane of the Report Properties window, in the Location picklist that appears, select the Biosolid application site to be reported. Once selected, press the **[Select]** button.
2. Once the site has been added, brief information about that site will be visible in the right pane of the window.
3. To change sites once it has been added, press the **[...]** button.

[Remove]
Press the [Remove] button to remove the selected Site from the report.

[Move Up/Dn]
To reorder the sites to be reported, highlight a site in the list and press the [Move Up] or [Move Dn] button.

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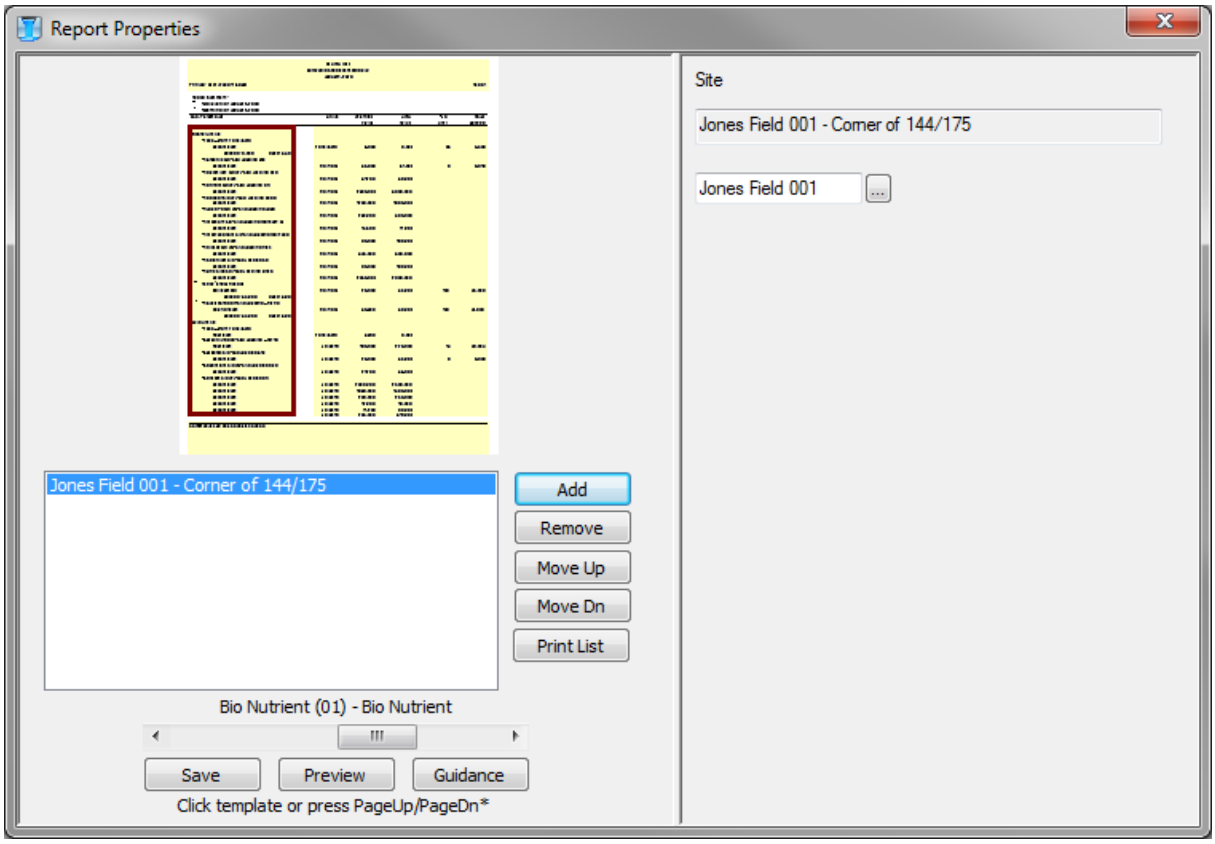

9.7.7.3.4 BioSolids Limit Report - Report Inclusions

Reporting Inclusions (Bio Limit Report)

Place a check or select an available option from the options on the right pane of the Report Properties window.

For additional help regarding the information to be included, see the Biosolid Limits section of the Main Help file.

Include - Choose to display Limits and/or Warnings (%)

- **[]Limits**
- **[]Warnings**

Limit Type - Choose from the available Limit Types to be shown

- **[]Accum Sum**
- **[]Year Sum**
- **[]Month Sum**
- **[]Soil Sample**
- **[]Quarter Sum**

Agency - Select the appropriate agency limits to be included on the report

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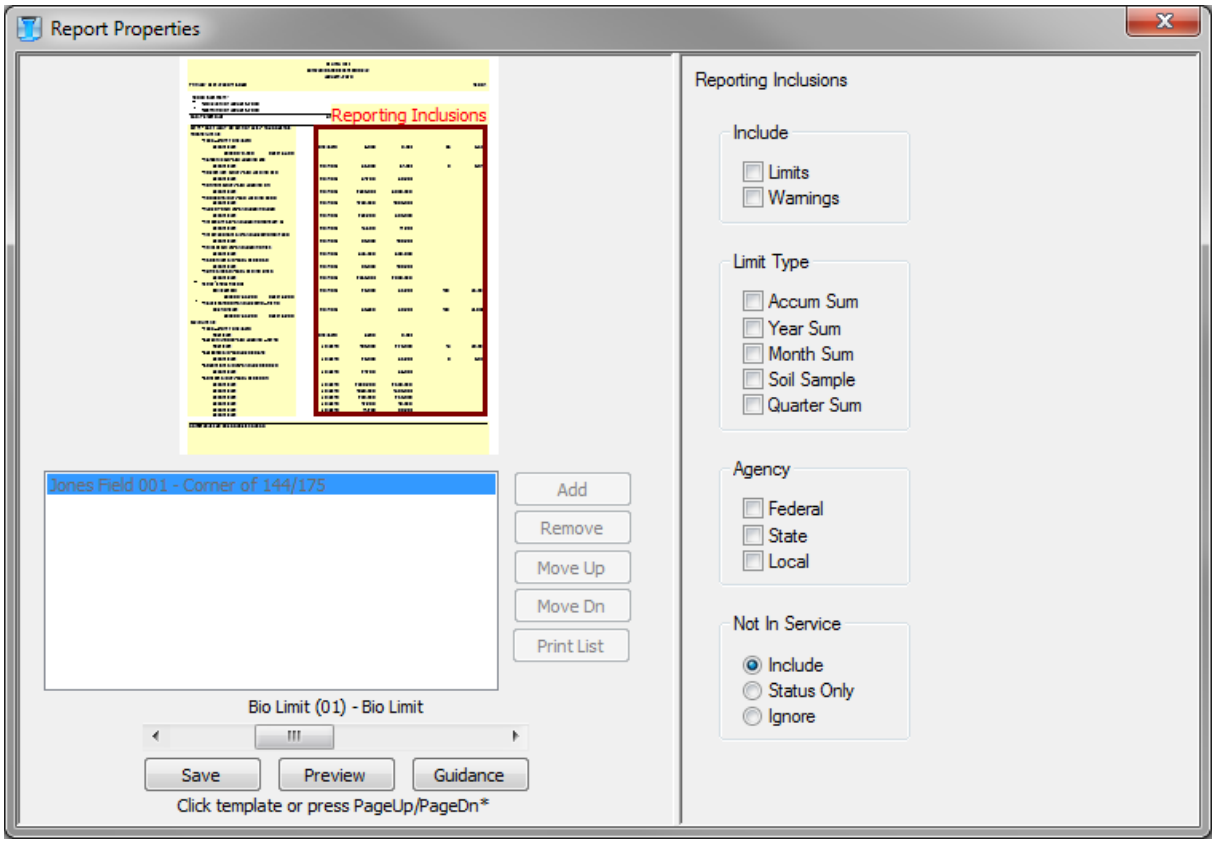
- **[]Federal**
- **[]State**
- **[]Local**

Not In Service - Select an option regarding the display of sites that are marked as Not In Service.

- **()Include**
- **()Status Only**
- **()Ignore**



9.7.7.3.5 BioSolids Limit Report - Comments

Comments:

Enter default comments to be displayed on the printed report, if the **[]Allow Comments** checkbox is checked in the General Properties section, users can edit these comments when printed.

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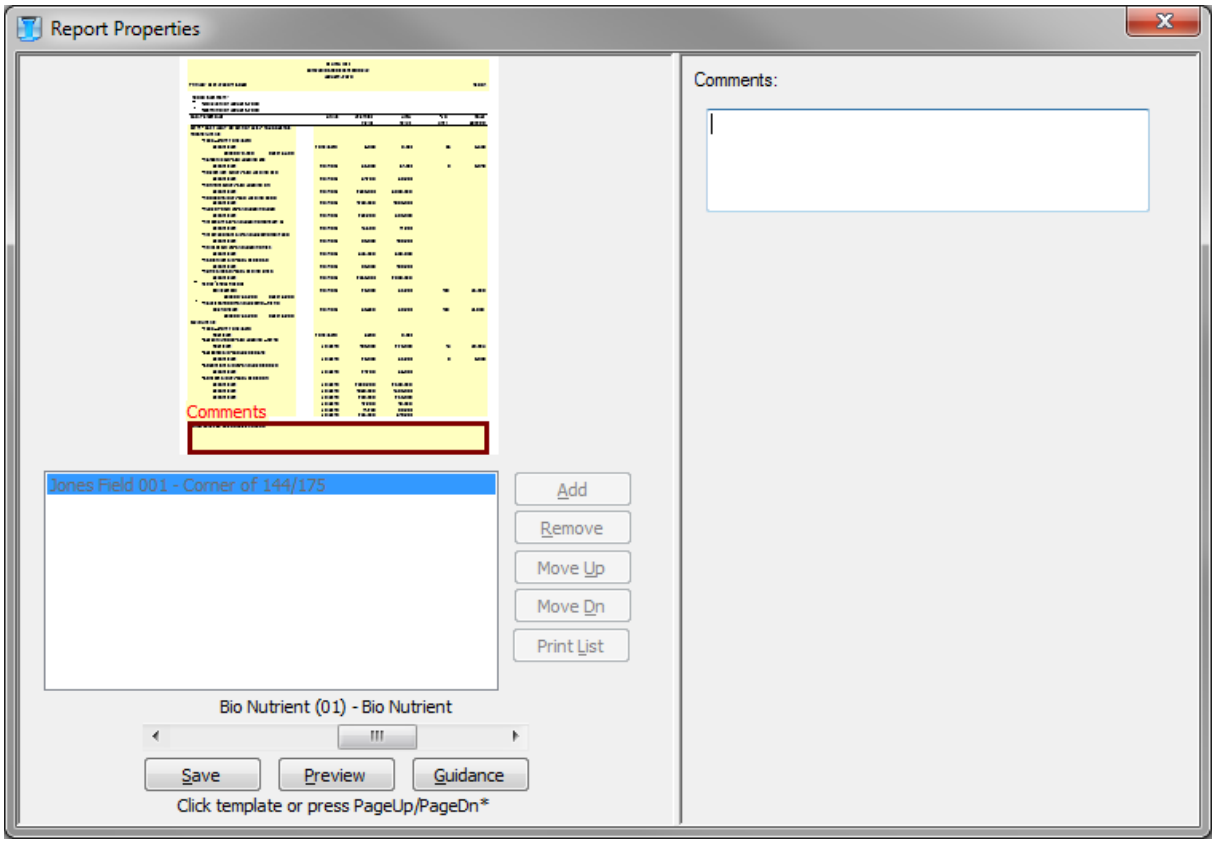

9.8 About

About

The **About** dialog shows current information about the application including copyright and version numbers for Operator10 - Wastewater Reporting Software.

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Part

10 Sampling Events

Sampling Events

The **Sampling Events** section is provided to track supporting information about a sampling event. This information would be similar to the information that would be on a chain of custody or laboratory bench sheet.

To access the **Sampling Events** section click the **View** ribbon and select **Sampling Events...** or click on the icon in the toolbar.

SAMPLING EVENT LIST

The sampling event application has two displayed grids. The upper grid, or **Event-level**, displays a list of sampling events that have been entered, along with the information associated with the event:

> Facility, Date, Location, COC# (Chain of Custody #), Employee, Sample Type, Sample #, Sampler #, Collection Method, Lab Certification, Sampling Time, Duration, Status, Comments and more...

The lower grid, or **Parameter-level** allows specific information about the tests performed on the sample to be added, such as:

> Parameter, Units, Multi-Values (when applicable), Result, Method #, Bottle #, Previous #, Special, Analysis Date, Analyst Number, Comments, and more...

Test results can be entered or modified at the **Parameter** grid. If data already exists in the database, it will be displayed.

Information can be entered into all columns. The navigation toolbar includes add, delete, group and allows a forward or backward search through the records. Grouping, filtering and sorting capabilities are available for all columns displayed in each grid.

NOTE: The grids displayed in the Sampling Event section of Operator10 - Wastewater have the general properties of the Grid and Grid Edit windows. (For more information about these sections, please see the topic: Grid Functionality).

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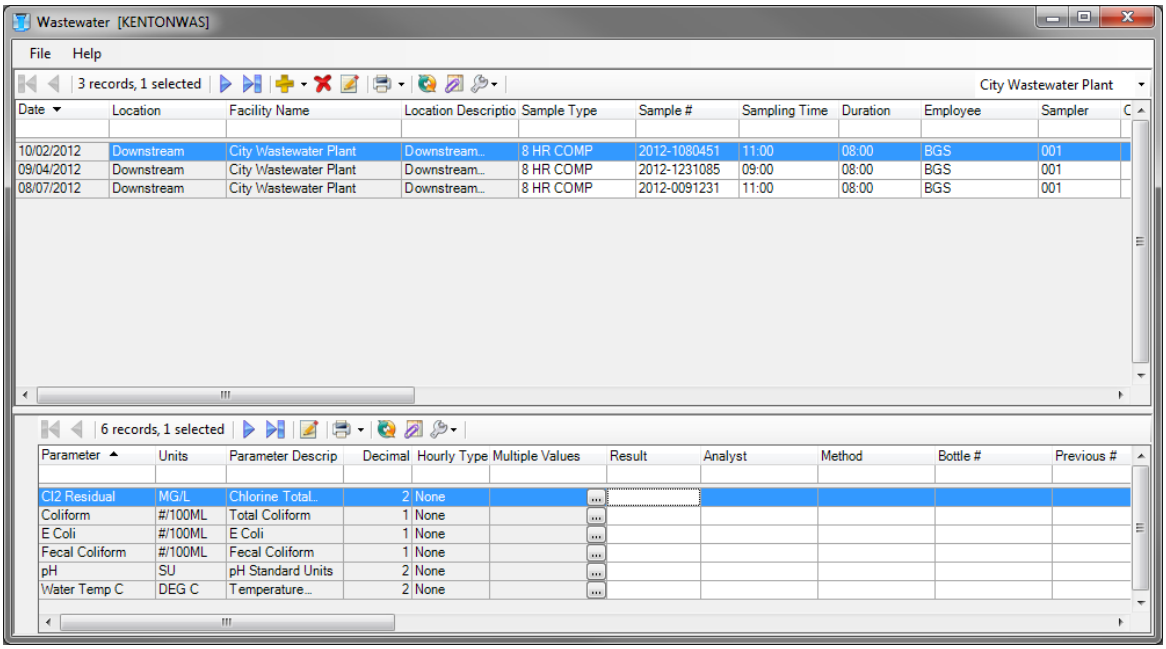
Wastewater [KENTONWAS]
File Help
3 records, 1 selected
City Wastewater Plant
Date Location Facility Name Location Descriptio Sample Type Sample # Sampling Time Duration Employee Sampler
10/02/2012 Downstream City Wastewater Plant Downstream... 8 HR COMP 2012-1080451 11:00 08:00 BGS 001
09/04/2012 Downstream City Wastewater Plant Downstream... 8 HR COMP 2012-1231085 09:00 08:00 BGS 001
08/07/2012 Downstream City Wastewater Plant Downstream... 8 HR COMP 2012-0091231 11:00 08:00 BGS 001
6 records, 1 selected
Parameter Units Parameter Descrip Decimal Hourly Type Multiple Values Result Analyst Method Bottle # Previous #
Cl2 Residual MG/L Chlorine Total.. 2 None
Coliform #/100ML Total Coliform 1 None
E Coli #/100ML E Coli 1 None
Fecal Coliform #/100ML Fecal Coliform 1 None
pH SU pH Standard Units 2 None
Water Temp C DEG C Temperature... 2 None

The Sampling Events section displays information related to the samples taken as well as data.

Sampling Events Topics

Additional Sampling Events topics include:

- Sampling Event Detail
- Add Sampling Event
- Delete Sampling Event
- Print Sampling Event

10.1 Sampling Event Detail

SAMPLING EVENT DETAIL

In the lower portion of the Sampling Event window, the **Parameter-level** information will be displayed. Parameters assigned to the Location of the selected Sampling Event are displayed automatically. In this area, users may enter results and testing information as it pertains to the selected parameter(s).

Data Entry

There are three possible types of data entry permitted for Location:Parameters in the Sampling Event program:

1. **Multiple Values** - For results that require more than a single daily value to be recorded, multiple value entries can be made. Location:Parameter setup will dictate which option is available, but 2 options exist.
    1. **Mulitple Daily Values** - For Location:Parameters that are set for Daily Data Entry, multiple values can be entered and summarized as a single daily result as chosen by the user. (See Image 1 below)

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2. **Hourly Values** - For Location:Parameters that are set for Hourly Data Entry, hourly values can be entered and summarized as a daily result as selected in the Location:Parameter setup. (See Image 2 below)

2. **Result** - For a daily value, enter the result in this column. For Location:Parameters that are set for Hourly Data Entry or that have used Multiple Values for entry, the summarized result will be displayed here.

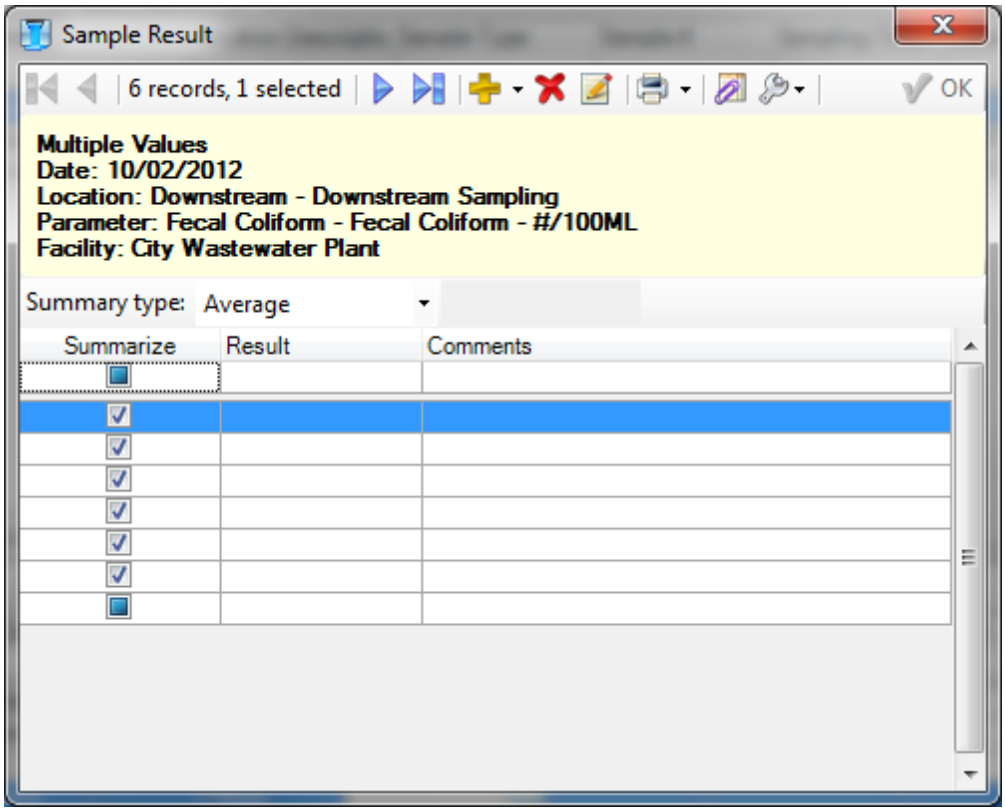

Image 1 - Multiple Values: Enter multiple single results for select parameters and summarize

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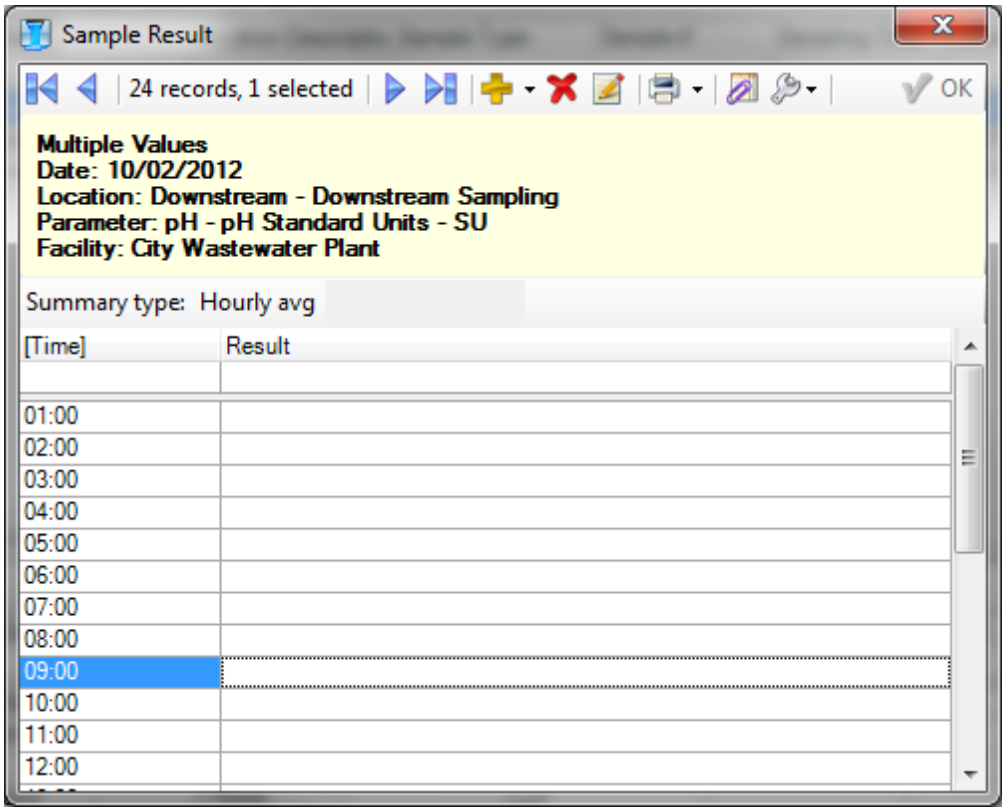

Image 2 - Hourly Values: Enter hourly results for select parameters

10.2 Add Sampling Event

ADD SAMPLING EVENT

To add a new sampling event, click the **[Add]** button in the toolbar. A pop-up window will be displayed, allowing you to enter all pertinent information about the Event.

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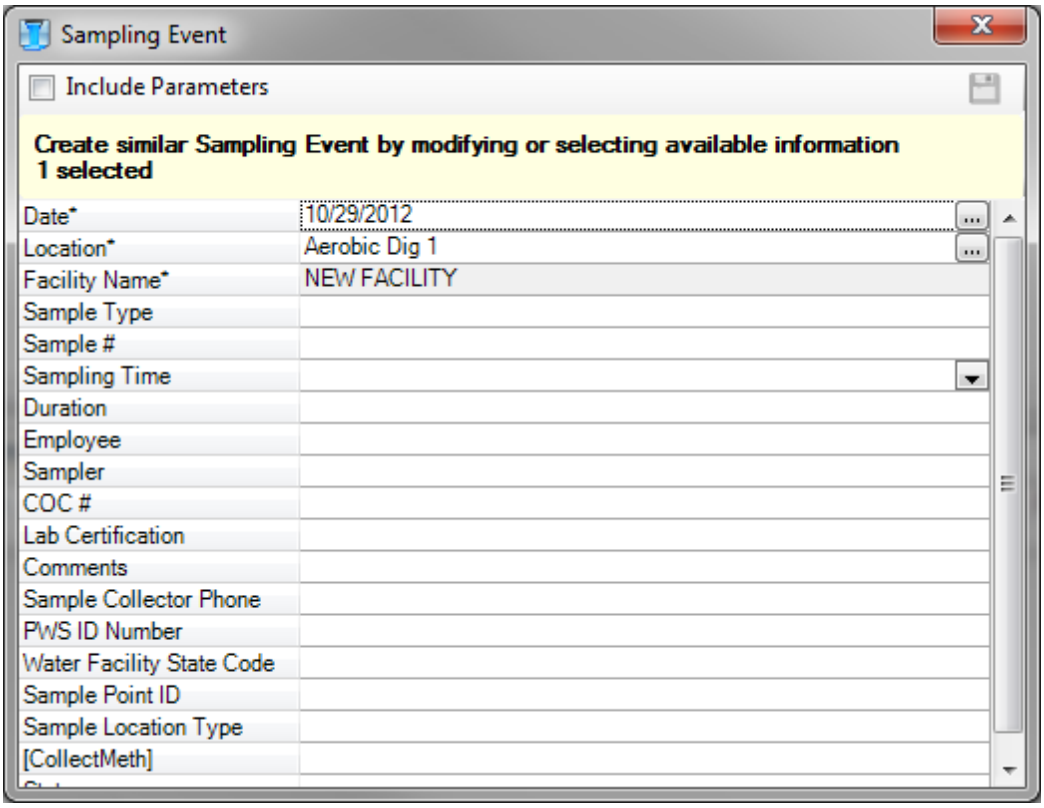

ADD SIMILAR SAMPLING EVENT

If a sampling event that has occurred is similar to an event that has already been entered into the Sampling Events section, adding a similar sampling event will allow users to copy and modify information for this new event based on previous events.

To Add a Similar Sampling Event, select an existing Sampling Event and click the drop-down arrow beside the **[Add]** button and choose **Add similar Sampling Event**.

In the Sampling Event window that appears, information will be present based on the selected record. Place a check in the box for **[ ] Include Parameters** located in the top-most portion of the window. This will ensure that similar parameter-level data is copied as well.

Click the **[Save]** button to continue.

10.3 Delete Sampling Event

DELETE SAMPLING EVENT

To delete a sampling event, single-select or multi-select a group of records, click the **[Delete Sampling Event]** button in the toolbar. You will be prompted to answer **[Yes]** or **[No]** before the record is deleted.

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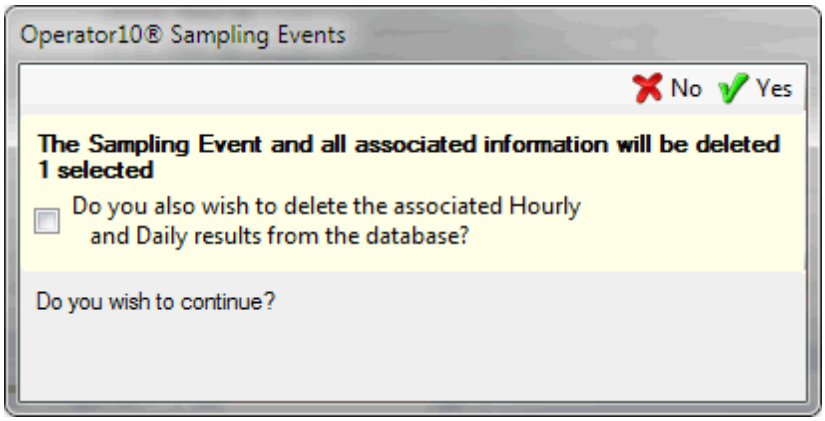
NOTE: When applicable, users may choose to delete accompanying data from the database. This data would include multiple value results, hourly data and daily data.


Operator10® Sampling Events
No
Yes
The Sampling Event and all associated information will be deleted
1 selected
Do you also wish to delete the associated Hourly and Daily results from the database?
Do you wish to continue?

10.4 Print Sampling Event

PRINT SAMPLING EVENT

To print a list-style or detail report of Sampling Events and their data, click the **[Print]** button to begin.

To view all available printing options, click the arrow to the right of the print icon. Choose from additional options to print specific reports.

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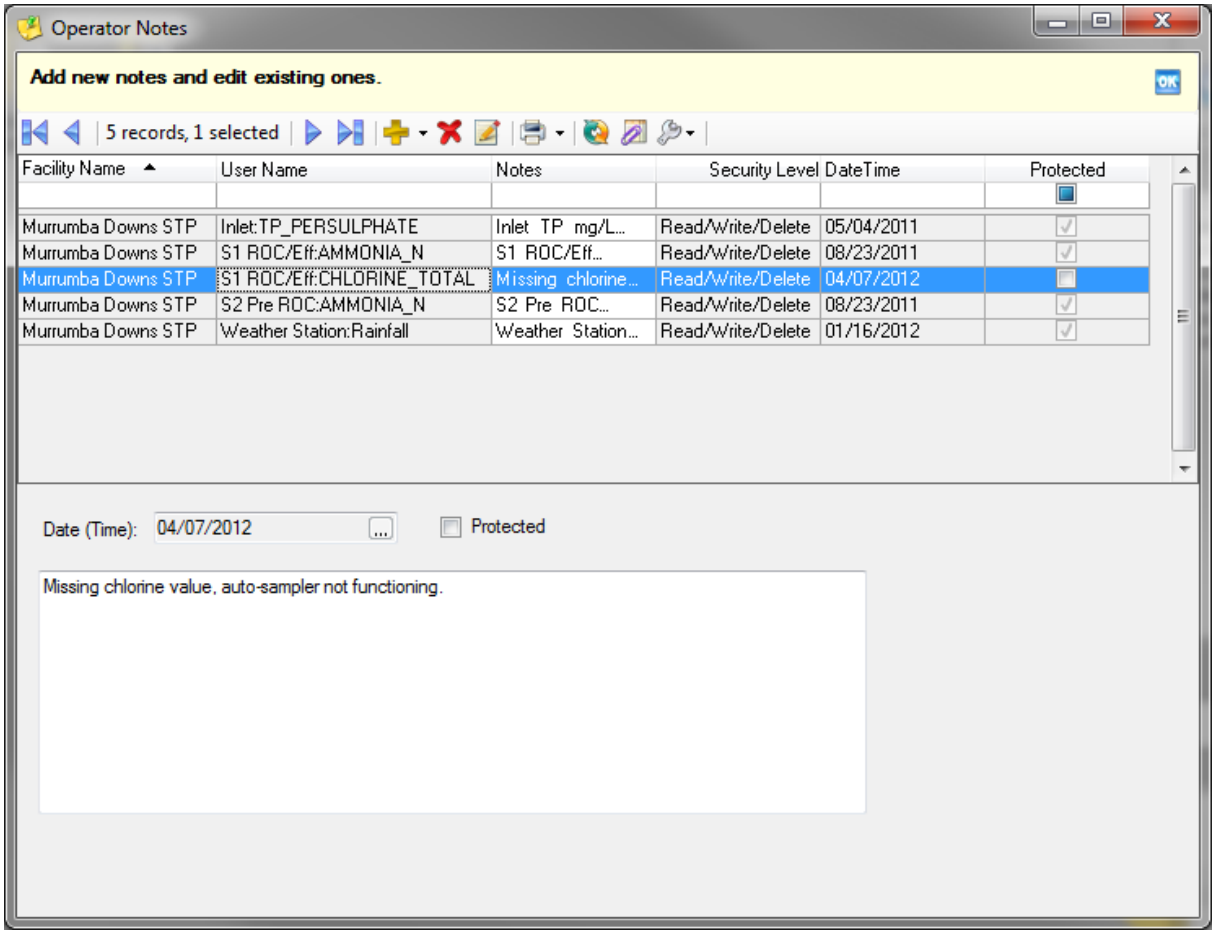
Part

11 Notes

Notes

Notes can be entered as they relate to specific data entered into the application (Quick Notes) as well as for day-to-day operation (Operator Notes). The Notes section provides access to the notes stored in the database as well as the ability to add, edit and delete notes.


Operator Notes
Add new notes and edit existing ones.
OK
5 records, 1 selected
Facility Name
User Name
Notes
Security Level
DateTime
Protected
Murrumba Downs STP | Inlet:TP_PERSULPHATE | Inlet TP mg/L... | Read/Write/Delete | 05/04/2011
Murrumba Downs STP | S1 ROC/Eff:AMMONIA_N | S1 ROC/Eff... | Read/Write/Delete | 08/23/2011
Murrumba Downs STP | S1 ROC/Eff:CHLORINE_TOTAL | Missing chlorine... | Read/Write/Delete | 04/07/2012
Murrumba Downs STP | S2 Pre ROC:AMMONIA_N | S2 Pre ROC... | Read/Write/Delete | 08/23/2011
Murrumba Downs STP | Weather Station:Rainfall | Weather Station... | Read/Write/Delete | 01/16/2012
Date (Time): 04/07/2012
Protected
Missing chlorine value, auto-sampler not functioning.

The Operator Notes section displays notes entered for data as well as day-to-day notes.

Accessing Operator Notes

The Notes section can be accessed by going to the **View** menu/ribbon and clicking the **[Notes]** button.

Add Note

To create a new note, click the **[Add]** button to begin. Enter a date/time stamp for the note by clicking the **[...]** button.

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Begin entering notes or comments in the text entry field that appears at the bottom of the window.

Check the **[ ] Protected** checkbox to indicate that this note should not be edited by other users.

Edit Note

To edit an existing note, highlight the note in the grid and click the **[Edit]** button to begin editing the note.

Delete Note

To delete an existing note, highlight the note in the grid and click the **[Delete]** button to delete the note. Confirm the deletion of the note by clicking the **[Yes]** or **[No]** button.

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Part XII

12 Interfaces

Topics in this section include:

- OPC/DDE Interface

12.1 OPC/DDE Interface

OPC/DDE Interface Application

NOTE: Access to the OPC/DDE Interface requires OPC/DDE Interface License, consult with AllMax Account Representatives or Technical Support for more information.

The AllMax **OPC/DDE Interface** (OLE for Process Control)/(Dynamic Data Exchange) is a separate Client/Server application that can be used both to **Retrieve** data on a **Daily** or periodic (**Real-Time**) basis, and to allow **DDE Access** to Operator10 data values. Data can be exchanged with any running application which supports OPC or DDE Linking. Since the **OPC/DDE Interface** application is able to both share and retrieve data, it is technically known as both a **DDE Server**, a **DDE Client**, and an **OPC Client**. It is capable of linking with any running application which supports OPC or DDE links, such as most SCADA software, Microsoft Excel or Access, Wonderware InTouch Viewer, or Intellution FIX.

- OPC/DDE Interface Application Overview
- OPC/DDE Interface Main Window
  - Start/Stop Buttons
  - Add, Edit, Remove, Print, Setup, Log Buttons
- OPC/DDE Links Listbox
  - OPC/DDE Link Definition
- DDE Link Examples
- DDE Server Functionality
- DDE Error Codes
- NetDDE (Network DDE)

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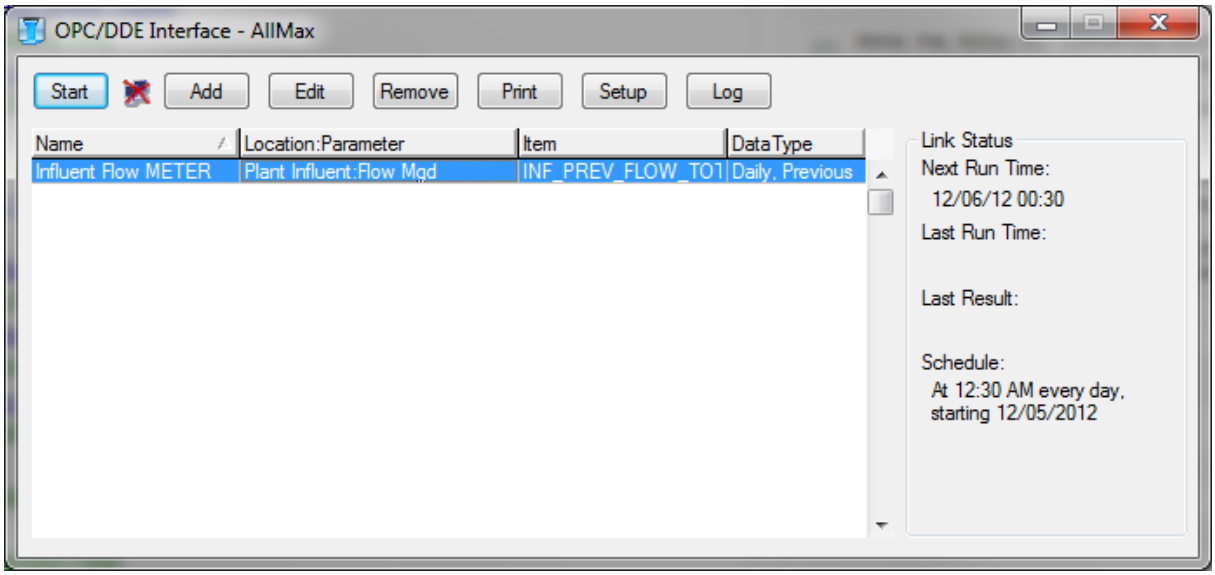

(Image has hotspots, click to view more information)

12.1.1 OPC/DDE Interface Overview

OPC/DDE Interface Application Overview

The AllMax Operator10® **OPC/DDE Interface** (OLE for Process Control)/(Dynamic Data Exchange) is a separate Client/Server application that can be used both to **Retrieve** data on a Daily or periodic (**Real-Time**) basis, and to allow **DDE Access** to Operator10 data values. Data can be exchanged with any running application which supports DDE Linking. Since the **DDE Interface** application is able to both share and retrieve data, it is technically known as both a **DDE Server** and a **DDE Client**. It is capable of linking with any running application which supports DDE links using the ASCII text format, such as Microsoft Excel or Access, Wonderware InTouch Viewer, or Intellution FIX.

When the application is started, sign in with a **User Name** and **Password** that has been assigned OPC/DDE rights for a "DEFAULT" Facility.

As an **OPC** or **DDE Client**, the AllMax Operator10® OPC/DDE Interface can retrieve and summarize data from several data sources. See the OPC/DDE Interface Main Window help topic for complete information.

As a **DDE Server**, the AllMax Operator10® OPC/DDE Interface provides an individual data or formula value, or a month or hourly range of values. The Facility which is to be accessed MUST be configured to "Allow sharing of Facility data" in the Facility Options. The data is identified by specifying the Facility, optional Formula, Location, Parameter, and optional Date with optional time. See DDE Server Functionality for complete information. The DDE Link format is as follows:

Service: OP10
Topic: DATA or MONTH or HOUR or FORMULA or DV
Item: facility[.dataview][[.formula].location.parameter][.[<]date[[<][#][time] [00:00]]

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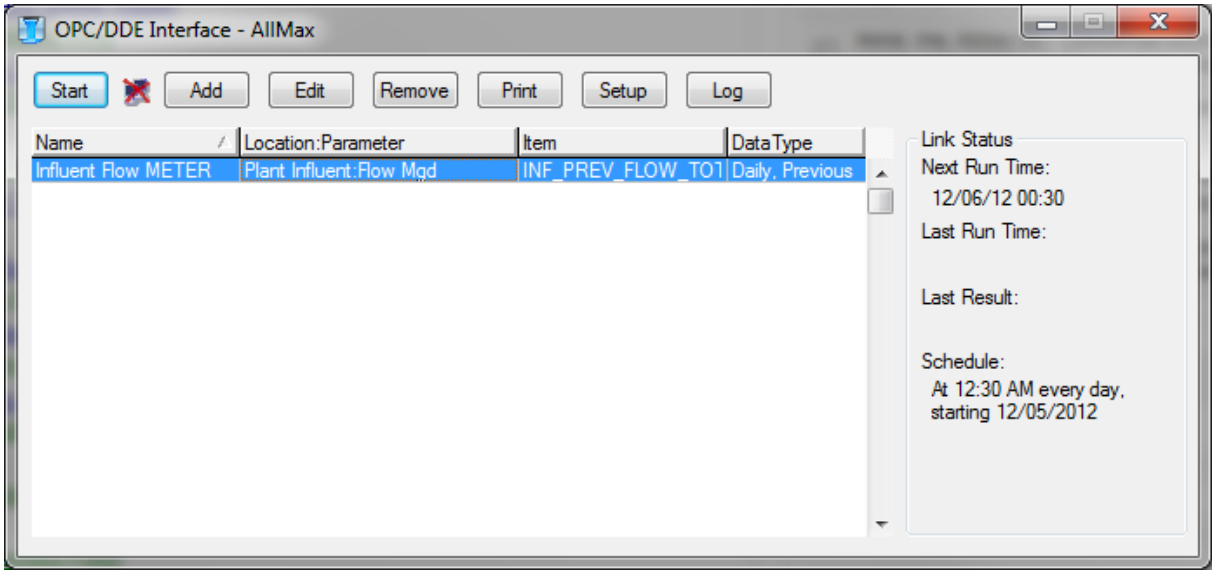
12.1.2 OPC/DDE Main Window

OPC/DDE Interface Main Window

The AllMax Operator10® OPC/DDE Interface **Main Window** provides complete OPC/DDE Client capabilities.

Click on any item below for additional information:



(Image has hotspots, click to view more information)

12.1.2.1 OPC/DDE Link List

OPC/DDE Links Listbox

The **OPC/DDE Links Listbox** displays list of all created OPC/DDE Links. The listed order can be sorted by clicking the header of the desired column **(Name, Location:Parameter, Item, Data Type)**.

To view Link details, simply highlight the OPC/DDE Link--the details will appear to the right side of the dialog box in the Link Status frame.

To edit Link details, simply highlight the OPC/DDE Link, and click the [Edit] button to modify the link.

> ***NOTE:*** Any links which are inactive (have been reset, or are scheduled for zero times per day) appear at the end of the Listbox with a date and time of zero.

12.1.2.2 OPC/DDE Add/Remove/Print/Setup/Log

OPC/DDE Add, Edit, Remove, Print, Setup, Log Buttons

[ADD]

Press the **[Add]** button to begin the process of adding a new OPC/DDE Link. (see:

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OPC/DDE Link)

[EDIT]

Press the **[Edit]** button to edit an existing link. (see: OPC/DDE Links)

[REMOVE]

Press the **[Remove]** button to remove a selected OPC/DDE Link.

When prompted acknowledge the removal by pressing **[Yes]** or **[No]**.

[PRINT]

Press the **[Print]** button to print the list of OPC/DDE links.

[SETUP]

Press the **[Setup]** button to view the setup configuration of the Operator10 OPC/DDE Interface (see: OPC/DDE Setup)

[LOG]

Press the **[Log]** button to show the OP10_DDE.LOG log file (see: OPC/DDE Log)

12.1.2.3 OPC/DDE Start & Stop

Start and Stop Buttons

Press the **[Start]** button **to start the internal timer** which controls when OPC/DDE Links are enacted. The Current Date and Time will be displayed and update while the timer is running. Any overdue Links will be immediately enacted, and Daily Summary information collected. The links will continue to be enacted at their set times, even if the OPC/DDE Interface window is iconized or hidden behind other windows.

Press the **[Stop]** button **to stop or pause the internal timer**. The Current Date and Time display will freeze, and no links will be enacted. Daily Summary information remains unchanged.

12.1.3 OPC/DDE Links

OPC/DDE Links

The addition or editing of links is performed using the OPC/DDE Link dialog seen below.

- Link Name
- AllMax Definition
- Server Definition
- Schedule

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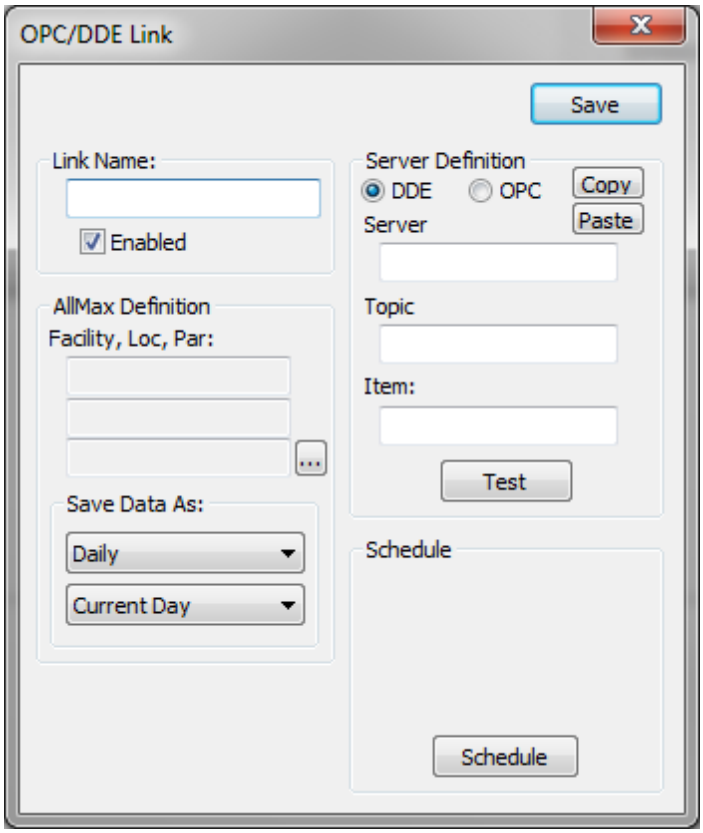

(Image has hotspots, click on sections to learn more!)

12.1.3.1 OPC/DDE Link Name

OPC/DDE Link Name

Enter the **Link Name** (1 to 30 characters) for an OPC or DDE Link to be created. The name must be unique, and will be shown in the OPC/DDE Links Listbox and Log File.

Check the **[ ] Enabled** checkbox to tell the OPC/DDE Interface to read this at the next scheduled time.

12.1.3.2 OPC/DDE Link AllMax Definition

AllMax Database Definition

A valid Facility, Location:Parameter, and Data type must be specified for each OPC/DDE Link.

Press the **[...]** button beside the **Parameter** field to select the Facility, Location and Parameter together.

Choose a the Data Type in the Save Data As: frame from the drop-down list boxes.

Daily :
A single data value is stored for each day.

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Daily - Current Day:
A single data value is obtained each day.

Daily - Previous Day:
A single data value is obtained each day, but it is written to the previous day.

Time:
A single data value is obtained each time interval as selected from the second drop-down list box.

Time - Actual Time:
A single data value is stored as hourly data using the current time.

Hourly - Hourly, 30, 15, 10, 5 Minute Precision:
Any value received is Quantized to force data to be moved to the preceding 60, 30, 15, 10, or 5 minute interval. (For example, a 15 minute interval will force data from 08:25 to 08:15.)

Summary:
Multiple retrieved values are summarized for the day then written once as a daily value.

Daily Sum, Average, Maximum, Minimum, Count, and Geometric Mean:
Multiple retrieved values are summarized for the day, then written once as a daily value according to the selected calculation type.

12.1.3.3 OPC/DDE Link Server Definition

OPC/DDE Link Server Definition

The data value returned by a OPC/DDE (OLE for Process Control)/(Dynamic Data Exchange) Link with another application requires specific Service, Topic, and Item DDE strings, or Node, Server, and Item OPC strings (see documentation of the other application). Retrieving data via OPC/DDE links is very dependent upon another application, and may therefore be somewhat slower than other data transfers, especially if the link must "time out" because of errors. In most cases, the other application must be running and the appropriate file must be open. Operator10 ® DDE Links require the other DDE application to be able to return a single value in the ascii text (CF_TEXT) format.

For DDE Links:
The **Server** string (1 to 30 characters) is usually the name of the application, the **Topic** string (1 to 90 characters) is usually the filename and/or page, and the **Item** string (1 to 90 characters) is usually a reference to the specific data. The Service, Topic, and Item strings for a DDE Link which has been copied to the Windows clipboard may be entered by pressing the **[Paste]** button.

For OPC Links:
The optional **Node** string (0 to 30 characters) is the name or IP address of the of the workstation where the server is running, the **Server** string (1 to 90 characters) is the name of the OPC Server, and the **Item** string (1 to 90 characters) is a reference to the specific data.

Enter an optional **Node** string, or choose from a PickList by pressing the **[...]** popup button. If the Node string is left blank, the local workstation is assumed.

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Enter the **Server** string, or if a valid Node is already entered (or the Node is blank), choose from a PickList by pressing the **[...]** popup button.

Enter the **Item** string, or if a valid Server is already entered, choose from a PickList by pressing the **[...]** popup button.

For both Link types:

The **[Test]** button allows users to test communication with the selected **Server** or **Node**. Press the button to see a display of the value collected at the time of pressing **[Test]**.

12.1.3.4 OPC/DDE Link Schedule Definition

OPC/DDE Link Schedule Definition

The OPC/DDE Link **Schedule** controls when, and how often, links are enacted each day.

Press the **[Schedule]** button to schedule the OPC/DDE Link.

In the window that opens, choose the appropriate interval from the **Schedule Task:** drop-down list box.

In the **Start time:** list box, select the appropriate time to begin collecting data each day. Press the **[Advanced]** button to view advanced features.

NOTE: Choose **Daily** then a **Start time**, and then press **[Advanced]** to schedule the link to be read on an hourly basis or on an interval of minutes.

NOTE: Users unfamiliar with Windows Task Scheduler should contact AllMax Software Technical Support for help and insight into scheduling with the new OPC/DDE Interface.

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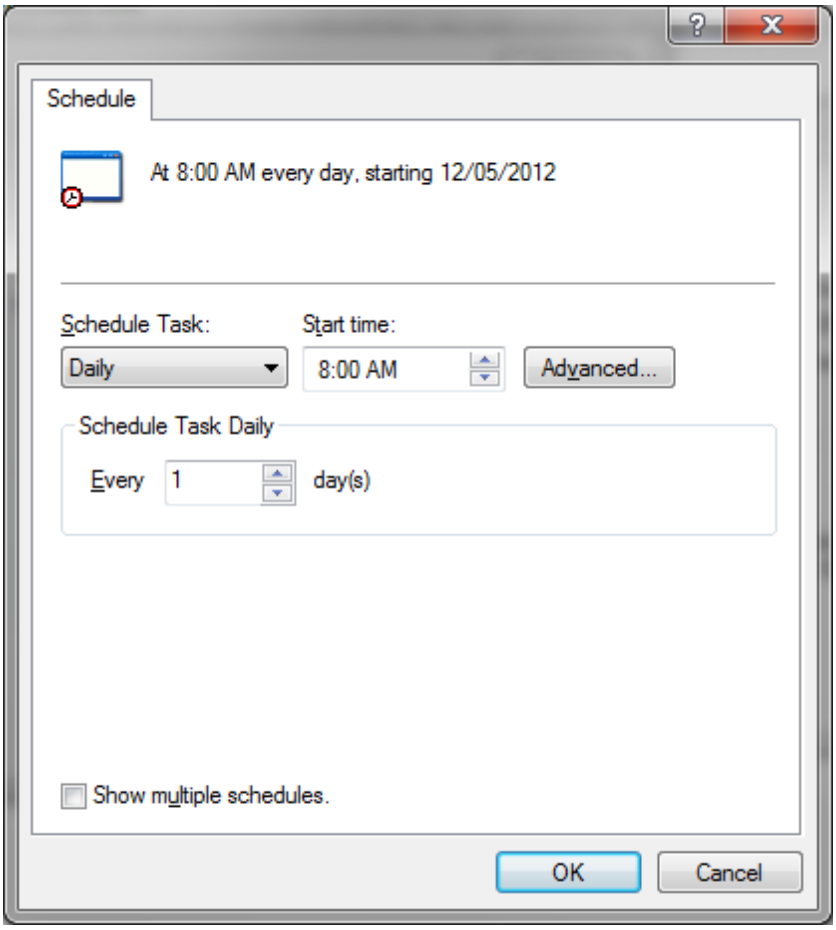

12.1.3.5 OPC/DDE Link Examples

DDE Link Examples

The following examples describe common DDE Service, Topic, and Item strings for other applications. See documentation of the other application for details. The **Service** string is usually the name of the application, the **Topic** string is usually the filename and/or page, and the **Item** string is usually a reference to the specific data.

Microsoft Excel example:
Server:EXCEL
Topic:[*filename or bookname*]*sheetname* (e.g. [Book1.xls]Sheet1)
Item:R#C# (e.g. R1C4)

Microsoft Access example:
Server:MSACCESS
Topic:*filename*;TABLE *tablename* (e.g. DB1.mdb;TABLE OP10Data)
Item:DATA

Microsoft Word example:
Server:WINWORD
Topic:*filename* (e.g. C:/MyDocs/Document1.doc)
Item:*bookmark* (e.g. DDE_LINK1)

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Wonderware InTouch Viewer example:
Server:VIEW
Topic:TAGNAME
Item:*tagname* (e.g. RawFlow)

Intellution FIX example:
Server:DMDDE
Topic:DATA
Item:*node:tag.field* (e.g. NODE1.TEMP.A_CV)

Citect example:
Server:CITECT
Topic:VARIABLE
Item:*variable tag* (e.g. FILTER_TANK_LEV)

LookOut example:
Server:LOOKOUT
Topic:*process file* (e.g. svgaeval)
Item:*object* (e.g. RawFlow)

RSLinx example:
Server:RSLINX
Topic:*station* (e.g. S1)
Item:*label* (e.g. F8:25)

12.1.4 OPC/DDE Functionality

Topics in this section include:

- OPC/DDE Setup
- OPC/DDE Log
- OPC/DDE Error Codes
- DDE Server Functionality
- NetDDE

12.1.4.1 OPC/DDE Setup

OPC/DDE Setup

In the **OPC/DDE Setup** window users of the Operator10 OPC/DDE Interface can modify certain aspects of data collection.

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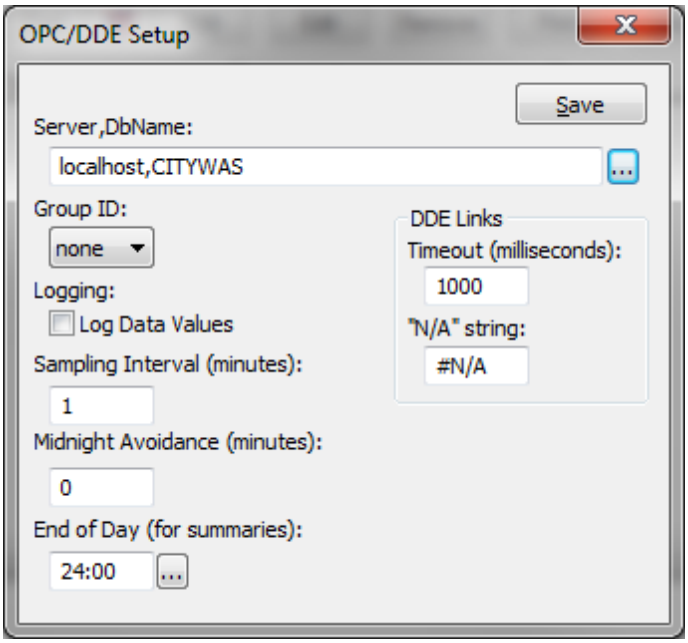

License Path:

To store data in a location other than the directory/folder where the OPC/DDE Interface is running from, press the **[...]** button to navigate and direct the interface to the correct location for data storage.

Group ID:

If you are using the OPC/DDE Interface on multiple computers and would like to create groups, select a **Group ID** from the drop-down list for each instance of the OPC/DDE Interface. For more information, contact the AllMax Software Technical Support Department.

Logging:

Check the **[ ] Log Data Values** checkbox to show all data retrieved by OPC/DDE Links. The data collection written to the database is also recorded in the log file.

NOTE: It is recommended that the []Log Data Values checkbox is left unmarked, to decrease the size of the log file and increase the speed of OPC/DDE Links. The option is provided for verification of data values and Data Summary information, or where a detailed record of data entry is required.

Sampling Intervals

Fill in a value (in minutes) for the OPC/DDE Interface to poll for active links.

Midnight Avoidance:

If the OPC/DDE Interface should avoid writing values before or after midnight, enter a number of minutes.

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DDE Links:

Timeout:

The timeout value, measured in milliseconds, tells the OPC/DDE Interface how long it should try to collect a reading before timing out.

"N/A" string:

If the application the OPC/DDE Interface is to read from has a specific string for blank data, enter it here.

12.1.4.2 OPC/DDE Log

OPC/DDE Log

The **OPC/DDE Log**, found in the main application directory, using the Windows Notepad application. The file includes dates and times for all events such as Loading and unloading the application, Starting, Stopping, and Resetting the timer, and and any errors encountered. In the Setup section, if the **[ ]Log Data** checkbox is marked, all data retrieved by OPC/DDE Links and written to the database is also recorded in the log file.

NOTE: It is recommended that the **[ ]Log Data** checkbox is left unmarked, to decrease the size of the log file and increase the speed of OPC/DDE Links. The option is provided for verification of data values and Data Summary information, or where a detailed record of data entry is required.

12.1.4.3 OPC/DDE Error Codes

DDE Error Codes

DDE Link errors may show the following **Error Codes**:

01 Advise Timeout
02 Busy
03 Data Timeout
04 DLL Not Initialized
05 DLL Usage
06 Exec Timeout
07 Invalid Parameter
08 Low Memory
09 Memory Error
10 Not Processed
11 No Conversation
12 Poke Timeout
13 PostMessage Failed
14 Reentrancy
15 Server Died
16 System Error
17 Unadvise Timeout

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18 Queue ID Not Found

12.1.4.4 DDE Server Functionality

DDE Server Functionality

As a **DDE Server**, the AllMax Operator10® OPC/DDE Interface provides an individual data or formula value, or a month or hourly range of values. The Facility which is to be accessed **MUST** be configured to "Allow sharing of Facility data" in the Facility Options. The data is identified by specifying the Facility, optional Formula, Location, Parameter, and optional Date with optional time. The DDE Link format is as follows:

Service: OP10
Topic: DATA or MONTH or HOUR or FORMULA or DV (see below)
Item: facility[.dataview][[.formula].location.parameter][.[<][date][[<][#][time] [00:00]] (see below)

(*see below for specific usage examples*)

The returned value for the each **Topic** is as follows:

DATA: the actual data value as a text string, including Less Than, Greater Than, Non-Detect values, Time values, or Alpha Codes.

MONTH: the daily data values for the entire month, each on a separate line, as a single text string, including including Less Than, Greater Than, Non-Detect values, Time values, or Alpha Codes.

HOUR: the 24 hourly data values for the entire day, each on a separate line, as a single text string, including Less Than, Greater Than, Non-Detect values, Time values, or Alpha Codes.

DV: the daily or hourly data values for an entire DataView, each separated by tabs with each day or hour on a separate line, as a text string, including Less Than, Greater Than, Non-Detect values, Time values, or Alpha Codes.

FORMULA: the result of the formula as a text string. The formula uses the location, parameter, and date specified as if it was being calculated in the main Operator10 application.

SYSTEM: the text string corresponding to the result of several Windows-specified topic strings such as "SysItems", "Topics", "Formats", "Status", or "Version".

> ***NOTE:*** If any data does not exist, the string "#N/A" is substituted.

The **Item string** is specified as follows:

facility: the facility name (1 to 31 characters) (required for all topics)

dataview: the dataview name (1 to 31 characters) (required for DV Topic, illegal for others)

formula: the formula name (1 to 31 characters) (required for FORMULA Topic, illegal for

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others)

location: the location name (1 to 16 characters) (required for DATA, MONTH, HOUR, FORMULA Topics, illegal for others)

parameter: the parameter name (1 to 16 characters) (required for DATA, MONTH, HOUR, FORMULA Topics, illegal for others)

date: the date in any valid format (optional, but required by time) (see also: Date)
If the '**<**' prefix is used, the previous day's date is substituted.
If the date is omitted, the current system date is assumed.

time: the time in any valid format (optional, but requires date) (see also: Time)
If the '**<**' prefix is used, the previous hour is substituted.
If the '**#**' prefix is used, the whole hour is substituted. For example, 02:01 through 03:00 is considered as 03:00.
If the hour is "00:00", the current system time is assumed.

> ***NOTE:*** If either or both of the '<' and '#' prefixes are used, the hour may be omitted and the current system time is assumed.

> ***NOTE:*** All components are separated by the '.' (period) character, except for the date and time which are separated by a space.

For example, Item "AllMax WasteWater Sample Data.Inf Dom.00400.01/02/10 08:00" would retrieve hourly data from 01/02/2010 at 8:00am from Location:Parameter "Inf Dom:00400" of the "AllMax WasteWater Sample Data" Facility. Or, use "AllMax WasteWater Sample Data.Inf Dom.00400.01/02/10" for the daily value, or "AllMax WasteWater Sample Data.Inf Dom.00400" to receive the daily value for today's current date. Or, use "AllMax WasteWater Sample Data.Disinfection Process" to receive all the daily values for the DataView using the current month. Note that each major portion of the Item is separated by the "." character, and no additional spaces are introduced other than between the date and time. The Item is not case specific.

To retrieve OP10 data values in Microsoft Excel, for example, the format for a cell would be "=OP10|DATA!'AllMax WasteWater Sample Data.Inf Dom.00400.01/02/10' ". Note that Excel requires the pipe character "|" and exclamation point "!" to separate Service, Topic, and Item portions, and it also requires all portions with embedded spaces to be surrounded by single quote characters " ' ".

> ***NOTE:*** The DDE Server can support both **"hot" links** (automatically updated) as well as the normal static links. To refresh the data supplied over "hot" links, use either the DDE_A() function during calculations or the Data|Data Utilities|DDE Advise menu item in the Operator 10 main application.

> ***NOTE:*** **DDE Server** capabilities are also provided by the Operator10 main application, since both load a common .DLL file. For most users, however, the OPC/DDE Interface is more practical because of its ability to act as a OPC/DDE Client, its small memory requirements (especially if it must stay loaded at all times), and its ability to be run without requiring an additional user license for multi-user installations.

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12.1.4.5 NetDDE

NetDDE

(Also known as: **Network DDE**)

NetDDE (Network Dynamic Data Exchange) services allow DDE links between different computers over a network. The NetDDE services are usually included in the Microsoft Windows operating system, but may need to be started and configured. "Shares" must be set up on any computer which will serve or "share" DDE data. Run the DDE Share utility (DDESHARE.EXE, usually found in the System directory/folder) to create and configure shares.

The **AllMax Operator10® OPC/DDE Interface** is fully compliant as both a **NetDDE Server** and a **NetDDE Client**. It is capable of linking with any running application which supports DDE links using the ASCII text format, such as Microsoft Excel or Access, Wonderware InTouch Viewer, or Intellution FIX.

To set up a NetDDE link:

1) Run the DDE Share utility on the computer where the software that provides data will be running.
2) Add a new Share:
   In the list of shares, press the [Add a Share] button.
   For the Share Name, enter a name ending with a "$" character.
   For the Static Application Name, enter the DDE Service string for the application.
   For the Static Topic Name, enter the DDE Topic string for the application.
   Mark the [] Is Service checkbox, to eliminate extra verification
3) "Trust" the new share
   Highlight the new share in the list of shares and press the [Trust Shares] button.
   Mark the [] Start Application Enable and [] Initiate to Application Enable checkboxes.
   Press the [Set] button to Set the trust.

In the AllMax Operator10® OPC/DDE Interface, specify the new NetDDE share:
Service: \\computername\NDDE$ (where computername is the network identifier for the computer)
Topic: sharename$ (where sharename$ is the Share Name entered in the DDE Share Utility)
Item: R#C# (e.g. R1C4)

Microsoft Excel example:
Run DDE Share on a computer named "SRVR003", create a new Share, and "Trust" it using these names:
Share Name: Excel_Book1$
Static Application Name: EXCEL
Static Topic Name: [*filename or bookname*]*sheetname* (e.g. [Book1.xls]Sheet1)

In the AllMax Operator10® DDE Interface, set up a DDE Link for:
Service: \\SRVR003\NDDE$
Topic: Excel_Book1$
Item: R#C# (e.g. R1C4)

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Part XIII

13 DataPort

Topics in this section include:

- DataPort Sync - Select L:Ps
- DataPort Setup
- AllMax Folder Software
- Operator10 DataPort Software

13.1 DataPort Sync - Select L:Ps

DataPort Sync - Select L:Ps

The DataPort Sync - Select L:Ps option allows users identify Location:Parameters for which readings and results should be entered on the DataPort Handheld Device using the Operator10 application. This allows users to potentially scan barcodes, enter and save results while in the field. The device will capture and store data as entered by users. Individual users can be created and L:P lists can be maintained independently from other users.

Accessing DataPort Sync - Select L:Ps

To access the Location:Parameter selection tool, go to the **Setup** ribbon/menu and choose the **[Select L:Ps]** button.

Selecting L:Ps

To select Location:Parameters to be sent to the DataPort when the HotSync operation is performed, follow these steps:

1. In the DataPort Sync window, click the **[Add]** button
2. In the window that opens press the **[...]** button to select a DataPort **User ID** for which the L:P should be exported
   a. Unlimited users can be created and individual lists can be maintained for each created user; the lists will export independently of one another and be used only when the appropriate ID is entered when performing the HotSync
3. In the **Facility Name** field, press the **[...]** button to choose a Facility from which the L:P will be selected
4. In the **Location:Parameter** field, press the **[...]** button to choose individual or multiple Location:Parameters to be exported for the selected User ID
5. Press the **[Save]** button to commit the selections to the database

Repeat the steps above as needed to produce a list of Location:Parameters for each DataPort user.

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Export L:P Lists

Once the L:P lists have been built for DataPort Users, the data must be exported as files that the DataPort HotSync operation can use to populate the DataPort with data. In the DataPort Sync window, find the **[Export Location:Parameter list to DataPort]** button. Press the button to build the lists. Text-based, indexed lists of Location:Parameters will be built to the database directory.

Repeat the Export step following the addition (or removal) of the desired Location:Parameters.

HotSync

Once lists of Location:Parameters have been exported, users should perform a HotSync operation to sync the selected Location:Parameter lists to the DataPort. See the DataPort HotSync topic for more information.

13.2 DataPort Setup

Prior to use of the DataPort, the following basic steps must be performed in order for proper communication between the HotSync support, Operator10 - Wastewater and DataPort. The communication chain allows for the transfer of data to and from the DataPort and Operator10 - Wastewater applications.

1. Install Palm Desktop Software, version 4.1.4 as provided by AllMax Software
2. Install Operator10 - Wastewater HotSync Support
3. Select Location:Parameters
4. Export Location:Parameter lists
5. Perform HotSync

Each of the basic steps will potentially require additional steps to be taken. Contact AllMax Software technical support for more information or refer to the linked help topics mentioned above.

13.3 AllMax Folder Software

AllMax Folder Software

The AllMax DataPort Folder Software provides easy access to the whole line of DataPort software products:

Operator10 - for Operator10 users
Antero™ DataPort Meter/Gauge Software - for Antero™ users
Antero™ DataPort Parts/Material Software - for Antero™ users
Antero™ DataPort Work Order Software - for Antero™ users
3Com® HotSync® Utility - for all users

Installation

© 2014 AllMax Software, Inc.

Main Window
Menu Bar
Preferences
Security

13.3.1 Installation

Installation

Software installation for the AllMax Folder requires only one step:

Installing Software into the DataPort

The **OP10 DataPort** handheld data entry unit available from AllMax will usually have the AllMax Folder Software pre-installed. Additionally, the same software can be used on 3Com PalmOS compatible PDAs, but without scanning capabilities. If you need to install or reinstall the software into a handheld unit, follow these steps:

In the Operator10 - Wastewater main application, select the **Setup** ribbon/menu, **DataPort** group, **Setup** icon and choose **Install AllMax software into DataPort** menu item. If more than one handheld is used on the workstation, select the appropriate Username when requested. Press the **[Done]** button in the confirmation dialog. Note that the software will be installed during the next HotSync operation.

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Press the HotSync button on the DataPort cradle to initiate a HotSync action and transfer the software.

NOTE: This step does not need to be repeated on multiple workstations, but **should be repeated** for multiple DataPort handheld units.

13.3.2 Main Window

Main Window

The AllMax Folder Software **Main Window** contains icons representing available software.

- Tap the icon to run the corresponding software. When the software is closed by tapping its **[Exit]** button, control returns to the Main Window.
- Icons may be disabled (hidden) or enabled (shown) by setting the Preferences.
- Security may be enforced for all DataPort applications. Contact AllMax for additional information.
- Enter a **DataPort ID** (1 to 3 characters) to identify the data to transfer to the DataPort during a HotSync.
- Tap the **[X]** button to exit the software.

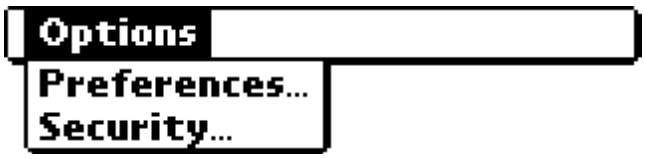
NOTE: The Battery Meter is displayed at the top of the window. The notch represents the battery level necessary for scanning.

NOTE: The Menu Bar is activated by tapping the title bar, or the [Menu] silkscreen at the left of the Graffiti area.

13.3.3 Menu Bar

Menu Bar

The **Menu Bar** is activated by tapping the **[Menu]** silkscreen at the left of the Graffiti area.



13.3.4 Preferences

Preferences

Several Icons may be enabled (and shown) by highlighting their corresponding PushButton:

Operator 10® Operations

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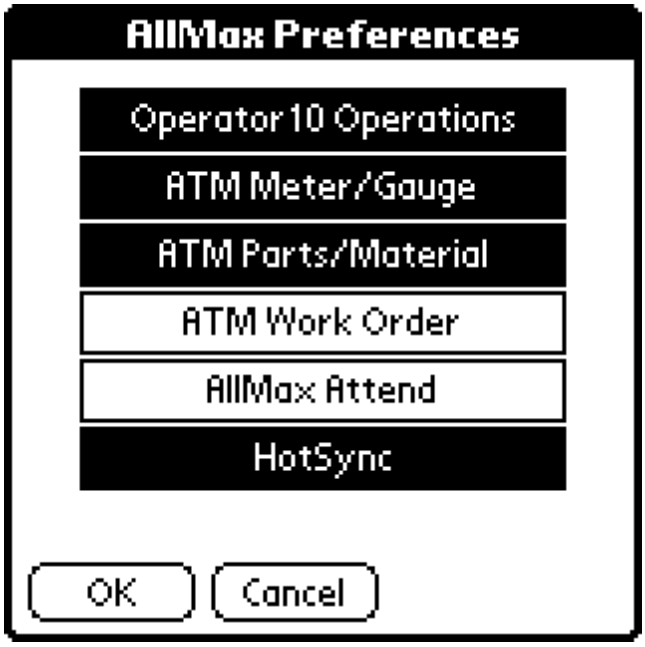
Antero™ Meter/Gauge
Antero™ Parts/Material
Antero™ Work Order
3Com® HotSync®



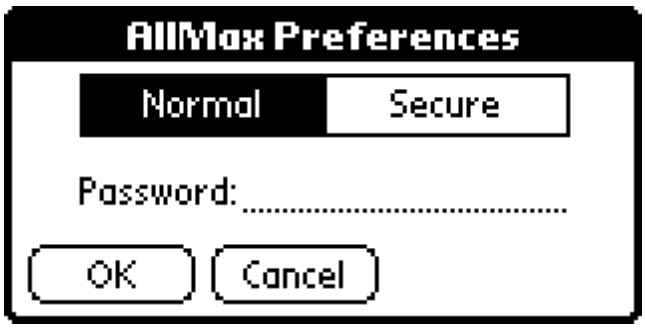
13.3.5 Security

Security

Security may be enforced for all DataPort applications.

Security requires selections by BarCode Scanning instead of using the PickLists, and always saves hourly data according to the system time.

NOTE: Contact AllMax for additional information and password.



13.4 Operator10 DataPort Software

Operator10 - Wastewater DataPort Software

The Operator10 - Wastewater DataPort software provides easy entry of data for

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Operator10 Wastewater, Water and Synexus users.

Installation

About
Calendar
Graffiti Help
KeyPad
Main Window
Menu Bar
Note
PickList
Preferences
Remove Record
Review Data
Scanner
Shortcuts
Time
Tips
Undo/Cut/Copy/Paste/Select All

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13.4.1 About

About

(Options | About)

In addition to copyright and trademark information, the **About** dialog provides version information for the software and scanner drivers.

13.4.2 Calendar

Calendar

Tap the calendar to select the date.

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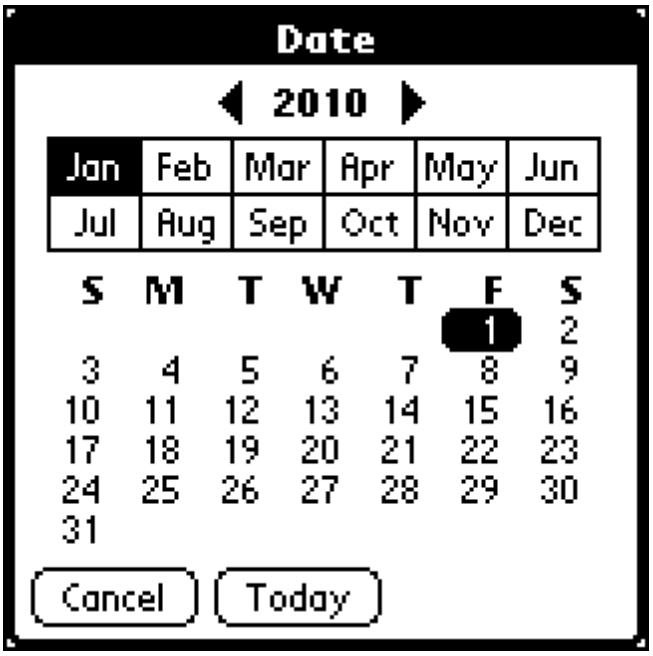
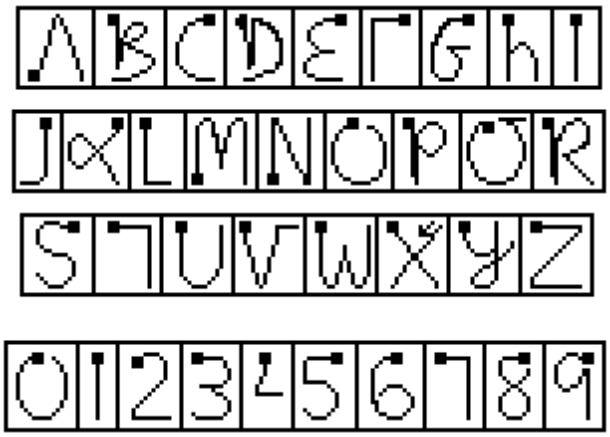

Date
2010
Jan Feb Mar Apr May Jun
Jul Aug Sep Oct Nov Dec
S M T W T F S
1 2
3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
31
Cancel
Today

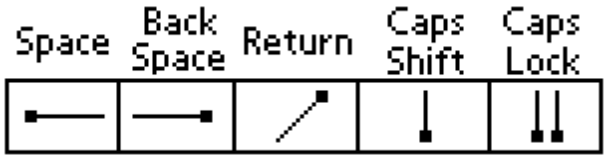
13.4.3 Graffiti Help

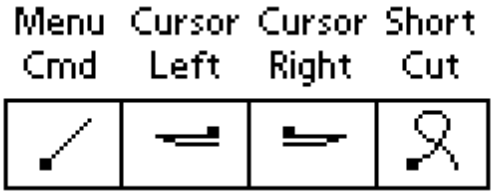
Graffiti Help

Common Graffiti strokes are illustrated through **Graffiti Help**.

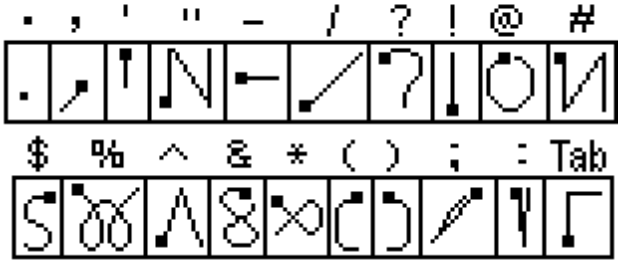
> ***NOTE:*** An alternative to graffiti is the internal popup keyboard, accessible by tapping the "**abc·**" logo at the bottom left corner of the graffiti area.



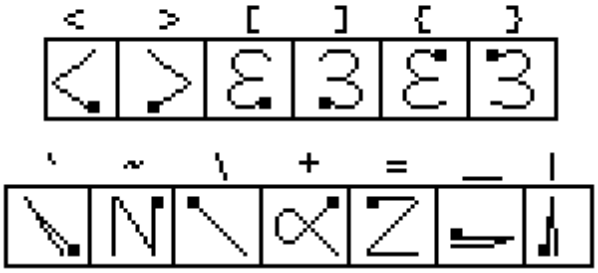




Punctuation shift = Tap once (•)



Punctuation shift = Tap once (•)



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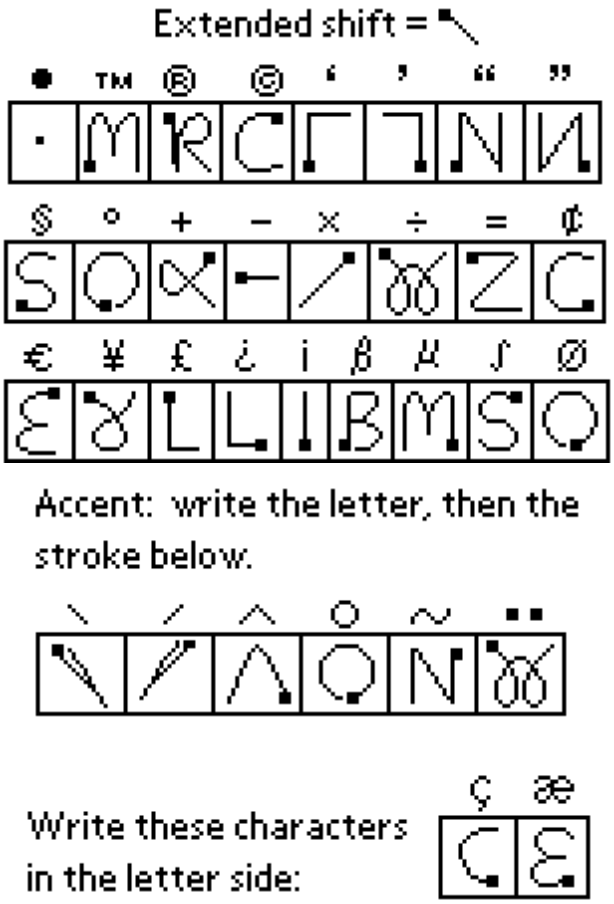

13.4.4 HotSync

HotSync

The DataPort HotSync operation is responsible for transmitting data between the Operator10 - Wastewater application and DataPort.

HotSync operations can be initiated from the DataPort cradle (hardware button) or from the HotSync app found on the DataPort Home screen (software button) as well as the AllMax Folder application on the DataPort.

When initiated, the HotSync manager application should be visible on screen and the transfer of data will begin.

13.4.5 Installation

Installation

Software installation for the DataPort requires these four steps:

Installing the HotSync Software on a Workstation
Installing the Operator10 HotSync Support
Installing Software into the DataPort

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Export Location:Parameters for the DataPort

1. **Installing the HotSync Software on a Workstation**
   Install the 3Com HotSync support software according to the provided instructions. If this is the first time you have installed the software, enter the name that will be used to identify the DataPort handheld unit.
2. **Installing the OP10 HotSync Support**
   HotSync conduits provide data exchange capabilities between the DataPort handheld and the Operator10 - Wastewater main application. In the Operator10 - Wastewater main application, select the **Setup** ribbon/menu, **DataPort** group, **Setup** icon and choose **Install HotSync Support** menu item. If the HotSync Manager is already loaded in the workstation's system tray, it must be restarted for the new support to take effect.
3. **Installing Software into the DataPort**
   The **DataPort** handheld data entry unit available from AllMax will usually have Operator 10® software preinstalled. Additionally, the same software can be used on 3Com PalmOS compatible PDAs, but without scanning capabilities. If you need to install or reinstall the software into a handheld unit, follow these steps:

   In the Operator10 - Wastewater main application, select the **Setup** ribbon/menu, **DataPort** group, **Setup** icon and choose **Install Operator10 software into DataPort** menu item. If more than one handheld is used on the workstation, select the appropriate Username when requested. Press the [Done] button in the confirmation dialog. Note that the software will be installed during the next HotSync operation.

   Press the HotSync button on the DataPort cradle to initiate a HotSync action and transfer the software.

   > ***NOTE:*** This step does not need to be repeated on multiple workstations, but should be repeated for multiple DataPort handheld units.

4. **Export Location:Parameters for the DataPort**
   In the **Operator10 - Wastewater** Main Application, go to the **setup** ribbon/menu and choose **Select L:Ps** and review the list of Location:Parameters to be exported. For more information on this process, see the DataPort Sync - Select L:Ps topic.

   Once all Location:Parameters are selected, find the toolstrip button to export the list. The Location:Parameter list will be installed during the next HotSync operation. (This step does not need to be repeated on multiple workstations.)

   Press the HotSync button on the DataPort cradle to initiate a HotSync action and transfer the software.

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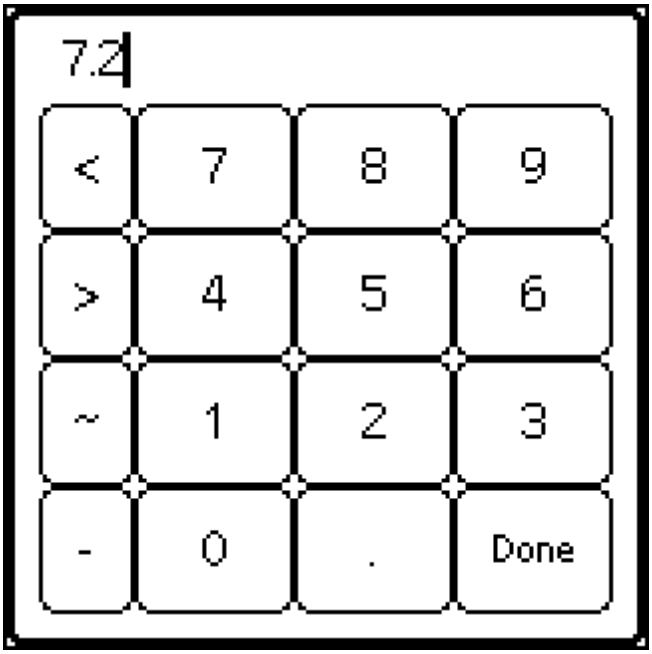
NOTE: This step does not need to be repeated on multiple workstations, but **should be repeated** whenever exported Locations or Parameters are changed.

13.4.6 Keypad

KeyPad

(Main Window [Key] button)

A popup **KeyPad** is available for entry of data values.



13.4.7 Main Window

Main Window

The DataPort **Main Window** is the central screen for data entry. All scanning should take place from this window.

- Tap the **[Date]** selector to set the date by using a popup calendar.
- If hourly data entries are entered, tap the **[Time]** selector to edit the time. The default setting , the **[Use System]** pushbutton, always uses the current DataPort time, but by selecting the **[Use Entered]** pushbutton a specific time may be entered for hourly data. Daily data values ignore time settings.
- **Facility, Location, and Parameter** may be scanned, selected from a **PickList**, or entered using graffiti.
- Enter a data **Value** using the popup KeyPad by tapping the **[Key]** button. Data values may also be entered by using graffiti, or the scanner. All data types (Daily or Hourly values, Less Than, Greater Than, or Non-Detect values, Time values, or Alpha Codes.) are supported. Enter "- -" or "blank" to enter a BLANK data value.

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- Tap the **[Value]** selector to quickly select the entire data Value text for replacement or editing.
- The Minimum (**lo:**) and Minimum (**hi:**) data entry limits, and the Parameter **units**, are shown below the value, when available.
- Tap the **[Save]** button to store the data. The data will be transferred during the next HotSync operation. If a valid combination of Facility, Location, and Parameter is not entered, or the format of the data Value is not recognized, or the value is not within the data entry limits, an error message is displayed. If all data is valid, a confirmation message is displayed. If a data value already exists for that combination of Facility, Location, Parameter, and Date (and Time), a warning message is displayed, with the option to cancel or replace the previous data value.
- Optionally tap the **[Note]** button to enter or edit a Note for the Date, Location, and Parameter combination.
- Tap the **[X]** button to exit the software. Control will return to the **AllMax Folder** software, if it is installed.

NOTE: The **Battery Meter** is displayed at the top of the window. The **notch** represents the battery level necessary for scanning.

NOTE: The **Menu Bar** is activated by tapping the title bar, or the **[Menu]** silkscreen at the left of the Graffiti area.

13.4.8 Menu Bar

Menu Bar

The **Menu Bar** is activated by tapping the **[Menu]** silkscreen at the left of the Graffiti area.

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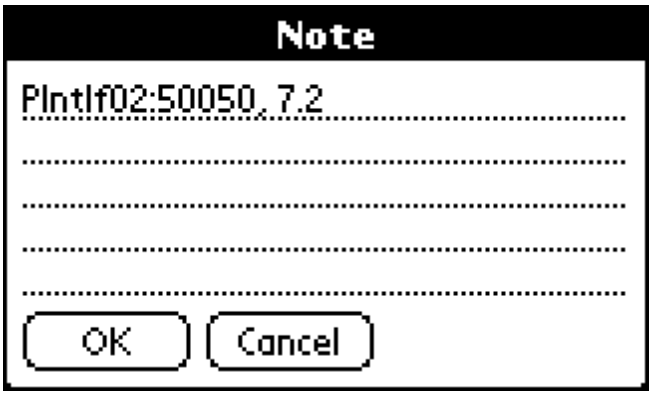
13.4.9 Note

Note

DataPort **Notes** are transferred to the Operator 10® application as **Operator Notes**. (Also as Quick Notes in the DataView application.)

- Tap the [Note] button to enter or edit a Note for the Date, Location, and Parameter combination. If a valid combination of Facility, Location, and Parameter is not entered, an error message is displayed.
- Enter the text by using graffiti, or by the popup keyboard (tap the "abc" logo in the graffiti area).
- To remove a note, highlight and backspace to delete the entire text.

The button displays a **+** character (**[Note+]**) when a note is present.



13.4.10 Picklist

PickList

Although Facilities, Locations, or Parameters are most quickly entered using the built-in scanner, they may also be easily selected from a **PickList**. Both Facilities and Locations display a complete list of available items. Once a valid Location has been entered, the Parameter PickList displays a filtered list of parameters. If there is no Location, or the [Loc:Par] button is pressed, a complete list of Location:Parameters is displayed.

- **Select any item** in the PickList by tapping on the item.
- The previous item (from the main screen) is automatically **highlighted** when opening the PickList. **To Find another item**, enter the first characters by using graffiti, or by the popup keyboard (tap the "abc" logo in the graffiti area). The first item matching the characters will scroll into place and the item will be highlighted.

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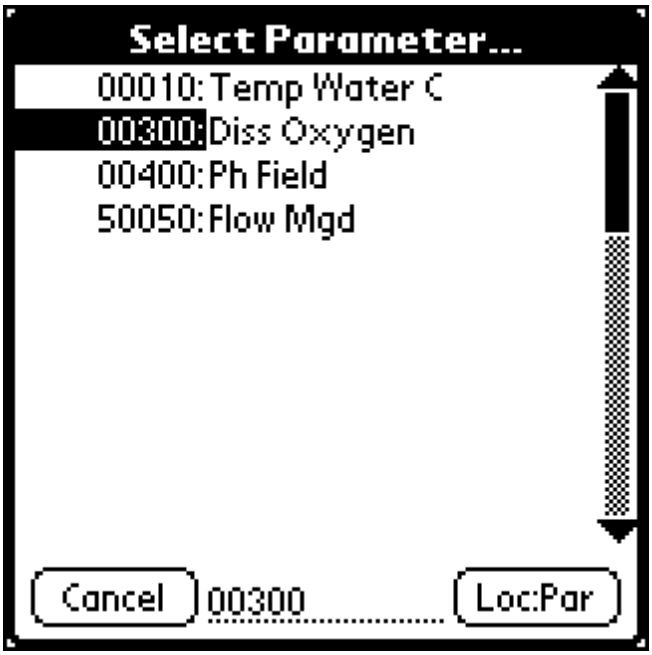
NOTE: A valid Facility must be entered prior to displaying the Location or Parameter PickList. A valid Location (or no Location) must be entered prior to displaying the Parameter (or Loc:Par) PickList.



13.4.11 Preferences

Preferences

Several **Scanner Preferences** may be selected with the following PushButtons:

- Tap **[Hold]** to scan only while a scan trigger button is depressed.
- Tap **[Click]** if scan should continue after the trigger buttons are released. (Either until a good scan is received, or it times out)
- Tap **[Wide]** to use a wide scanning angle (wide field of vision). (about 53 deg.)
- Tap **[Narrow]** if the scanner should use a narrower scanning angle. (about 38 deg.)
- Tap **[Scan Only]** if the scanner should scan when triggered.
- Tap **[Aim Prior]** to use a laser pointer to aim (1 second) before scanning.
- Tap **[Beep]** to sound a beep when a good scan is received.
- Tap **[Quiet]** if no sound should be heard.
- Tap **[Text Types]** to scan only BarCode types which support alphabetic characters.
- Tap **[All Types]** to scan all recognized BarCode types, including numeric-only.
- Tap **[Standard]** to scan standard BarCode types without optional checkdigits.
- Tap **[Extended]** to scan BarCode types with optional checkdigits or extensions.
- Tap the **[Reset Scanner]** selector to reinitialize the scanner.

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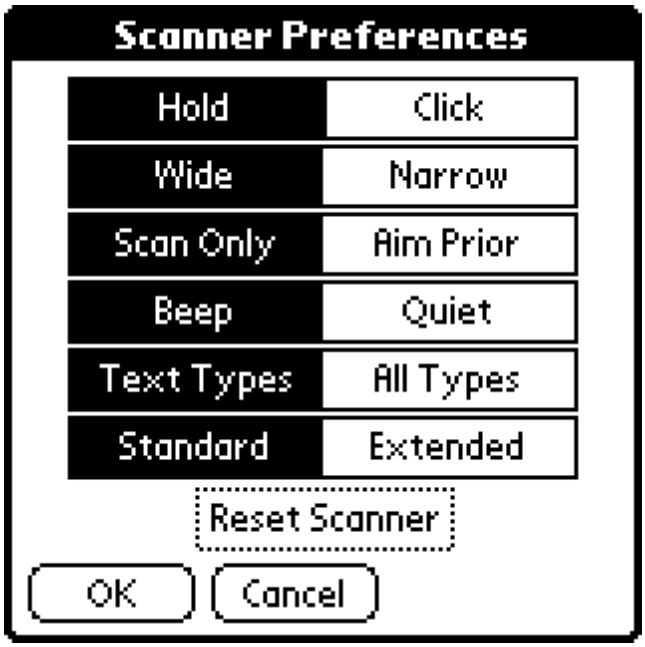

13.4.12 Remove Record

Remove Record

(Edit | Remove Record)

Remove (delete) the record matching the current Facility, Location, Parameter, and Date.

> ***WARNING:*** Removing data will delete existing data! Do not proceed unless you are sure you wish to remove data.

13.4.13 Review Data

Review Data

(Edit | Review Data...)

- Use the scrollbar, or the PageUp and PageDown hardware buttons, to Review previously entered Data.
- Tap the [Remove] button to remove (delete) the current record.

> ***WARNING:*** Removing data will delete existing data! Do not proceed unless you are sure you wish to remove data.

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13.4.14 Scanner

Scanner

- Open the OP10 DataPort **Main Window**.
- If BarCodes do **not** include an **AutoSelection Digit** (when scanning a Facility, Location, or Parameter) or if scanning a Data Value, tap to **place the cursor** in the appropriate field.
- **Press** either **scanner trigger** button to begin the scan. When a good scan is received, the DataPort will beep and display a green light. Otherwise, the scan will time out and the "No Scan" message will be displayed.

Entering data is as simple as 1-2-3!

1. **Scan** a Location:Parameter BarCode (use the default Date and Facility)
2. Enter the **Data** value from the popup KeyPad (or by using graffiti)
3. Press the **[Save]** button

CAUTION: Laser Light--Do Not Stare Into Beam. 630-680nm Laser, 1.0 mW Max Output Class II Laser Product

NOTE: The possible scanning range is from 2 to 24 inches, depending on BarCode bar width.

NOTE: Recommended operating temperature is from 10 to 90 degrees F.

NOTE: Possible BarCode scanning formats include:

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Text Formats:

Code 128 (recommended for most users)
Code 39 (Code 3 of 9)
Code 93

Numeric Formats:

Bookland EAN
Codabar
Coupon
D25
EAN/JAN-8
EAN/JAN-13
Interleaved 2 of 5
ISBT 128
MSI Plessey
Trioptic 39
UCC/EAN-128
UPC-A
UPC-E
UPC-E1

13.4.15 Shortcuts

Shortcuts

Graffiti:

- **Command+A** - About Dialog
- **Command+C** - Copy
- **Command+D** - Remove Record
- **Command+F** - Preferences
- **Command+G** - Graffiti Help
- **Command+P** - Paste
- **Command+R** - Review Data
- **Command+S** - Select All
- **Command+T** - Tips
- **Command+U** - Undo
- **Command+X** - Cut

> ***NOTE:*** Commands are entered by drawing a graffiti Command character (/) from lower left to upper right, then the character.

13.4.16 Time

Time

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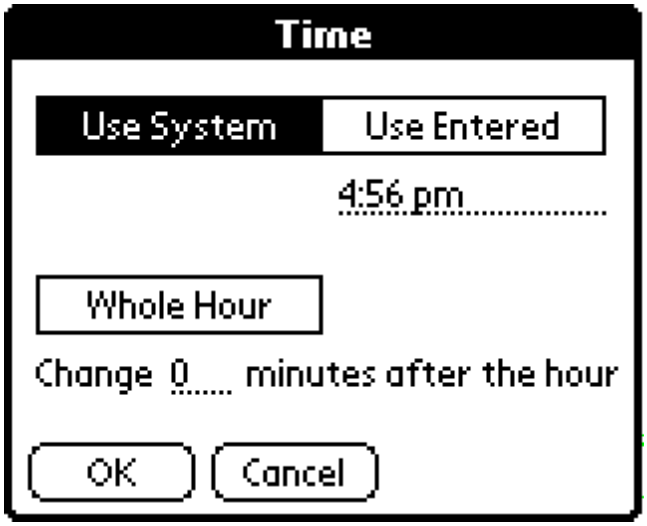
- If hourly data entries are entered, tap the **[Time]** selector to edit the time. The default setting , the **[Use System]** pushbutton, always uses the current DataPort time, but by selecting the **[Use Entered]** pushbutton a specific time may be entered for hourly data. Daily data values ignore time settings.
- If hourly data entries should be saved only on even hours (08:00, 09:00, etc.), select the **[Whole Hour]** pushbutton. Enter the number of minutes past the hour that the entry should be saved as the next hour.



13.4.17 Tips

Tips

(Options | Tips)
Entering data is as simple as 1-2-3!

1. **Scan** a Location:Parameter BarCode (use the default Date and Facility)
2. Enter the **Data** value from the popup KeyPad (or by using graffiti)
3. Press the **[Save]** button

13.4.18 Edit Commands

Undo/Cut/Copy/Paste/Select All

(Edit | Undo/Cut/Copy/Paste/Select All)

Cut, Copy, Paste, or Select All text in any field using these menu items or shortcut commands, using the clipboard. Use Undo to restore a field to its previous value.

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Part

14 Functions

General Information:

Data Types
Accessing Location:Parameter data values

Function Categories:

Boolean (TRUE/FALSE) Functions
Constant
Daily Data Functions
Date Functions
OPC/DDE Functions
Hourly Data Functions
Mathematical Functions
Miscellaneous Functions
Monthly Data Functions
Process Section Data Functions
Quarterly Data Functions
Trigonometry Functions
Violation Data Functions
Weekly Data Functions
Yearly Data Functions

All Functions (by groups)
All Functions (alphabetically)

14.1 All Functions (by groups)

All Functions (by groups)

See also: All Functions (alphabetically)

Data Types
Accessing Location:Parameter data values

Boolean (TRUE/FALSE) Functions:

AND(x,y); x&y; if x<>0 AND y<>0 then 1, else 0
BIT(x,y); if BIT x of y is 1 then 1, else 0
EQUAL(x,y); x=y; if x EQUALs y, 1, else 0
GT(x,y); x>y; if x is Greater Than y, 1, else 0
IF(x,y,z); IF x<>0 then y, else z
ISALPHA([l:p],x); if value IS an ALPHA code then 1, else 0, offset x days
ISBLANK(x); if x IS BLANK then 1, else 0
ISDATA(x); if x IS valid DATA then 1, else 0
ISDATE([l:p],x); if value IS a DATE value then 1, else 0
ISFECAL(l:p]); if p IS a FECAL parameter then 1, else 0

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ISFLOW([l:p]); if p IS a FLOW parameter then 1, else 0
ISGREAT([l:p],x); if value IS a GREATer than value then 1, else 0, offset x days
ISHR([l:p]); if l:p IS set for HouRly data entry then 1, else 0
ISLESS([l:p],x); if value IS a LESS than value then 1, else 0, offset x days
ISLP([l:p]); if L:P IS valid then 1, else 0
ISND([l:p],x); if value IS a Non-Detect value then 1, else 0, offset x days
ISTIME([l:p],x); if value IS a TIME value then 1, else 0, offset x days
LT(x,y); x<y; if x is Less Than y, 1, else 0
NOT(x); if x is NOT equal to 0 then 1, else 0
OR(x,y); x|y; if x<>0 OR y<>0, 1, else 0
XOR(x,y); if x OR y eXclusively then 1, else 0

Constants:

ASK, BLANK, BEEP, TRUE, FALSE, pi, e , 8.3, 3.785, .45359

Daily Data Functions:

D_AVG([l:p],x,y); AVeraGe, offset x days, for y days
D_COMP([l:p],x,y); offset x Days, COMPare offset y days
D_COUNT([l:p],x,y); COUNT, offset x days, for y days
D_FLOW([l:p],x,y); FLOW value, offset x months, for y days
D_FWA([l:p],x); Flow-Weighted Avg, offset x days, for y days
D_GAUGE([l:p],[l:p],x,y); GAUGE value, supply l:p, offset x days, multiplier y
D_GMEAN([l:p],x,y); Geometric MEAN, offset x days, for y days
D_IGAUGE([l:p],[l:p],x,y); Interpolated GAUGE value, supply l:p, offset x days, multiplier y
D_IMTR([l:p],x,y,z); Interpolated MeTeR value, offset x days, max meter reading y, multiplier z
D_INTER([l:p],x,y); INTERpolate from adjacent data, offset x days
D_LAST([l:p],x,y); LAST value not later than date, offset x months, y days
D_LASTN([l:p],x,y); average of LAST z Number of values not later than date, offset x months, y days
D_LASTNM([l:p],x,y,z); Median of LAST z Number of values not later than date, offset x months, y days
D_LASTNN([l:p],x,y,z,n); Nth highest of LAST z Number of values not later than date, offset x months, y days
D_LASTNP([l:p],x,y,z,w); wth Percentile of LAST z Number of values not later than date, offset x months, y days
D_LOADING([l:p],x,y); LOADING value, offset x months, for y days
D_MAX([l:p],x,y); MAXimum, offset x days, for y days
D_METER([l:p],x,y,z); METER value, offset x days, max meter reading y, multiplier z
D_MIN([l:p],x,y); MINimum, offset x days, for y days
D_NEXT([l:p],x,y); NEXT value not prior to date, offset x months, y days
D_STAT([l:p],[l:p],x,y,z); Daily STATistics, offset x days, for y days, type z
D_STDEV([l:p],x,y); STandard DEViation, offset x days, for y days
D_SUM([l:p],x,y); SUM, offset x days, for y days
D_TOTAL([l:p],x,y); avg * range, offset x days, for y days
D_VAL([l:p],x,y); VALue, offset x mon, y days
LP(l,p); [l:p]; Location:Parameter data

Date Functions:

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DATE([][j][m,d,y]); current, julian, or m/d/y DATE
DATE([j,x][m,d,y,x]); value x calculated on a julian or m/d/y DATE
DOM(x); Day Of Month, 1-31, offset x days
DOW(x); Day Of Week, 1-7, offset x days
DOY(x); Day Of Year, 1-365, offset x days
DVAL(j,x); VALue x for the julian Date j
LOM(x); Length Of Month 28-31, offset x months
LOY(x); Length Of Year 365-366, offset x years
M_DATE(x,y,z); Monthly DATE, offset x months, for month type y
MOY(x); Month Of Year, 1-12, offset x months
WDOM(x); WeekDay Of (1st of) Month, 1-7, offset x months
WOM(x); Week Of Month, 1-5, offset x days
YR(x); the YeaR, 1970-2037, offset x years

Hourly Data Functions:

H_AVG([l:p],x,y); Hourly AVeraGe, offset x days, hour y
H_CALC([l:p],x,y,z); Houlry CALCulations, value x, offset y days, type z
H_COMB([l:p],[l:p],x,y); COMBined Hourly, offset x days, type y
H_COUNT([l:p],x,y); Hourly COUNT, offset x days, hour y
H_FUNC([l:p],x,y,z); Hourly FUNCtion, offset x days, value y, type z
H_GMEAN([l:p],x,y); Hourly Geometric MEAN, offset x days, hour y
H_INTER([l:p],x,y); Hourly INTERpolate from adjacent data, offset x days, hour y
H_MAX([l:p],x,y,z); Hourly MAXimum, offset x days, hour y, option z
H_MED([l:p],x,y); Hourly MEDian, offset x days, hour y
H_METER([l:p],x,y,z); Hourly METER value, offset x days, max meter reading y, multiplier z
H_MIN([l:p],x,y,z); Hourly MINimum, offset x days, hour y, option z
H_PRTPWR([l:p],[l:p],x,y); Hourly PoWeR of PaRTicle counts, particle diameter X for first L:P, particle diameter Y for second L:P
H_STD([l:p],x,y); Hourly STandard Deviation, offset x days, hour y
H_SUM([l:p],x,y); Hourly SUM, offset x days, hour y
H_VAL([l:p],x,y); Hourly VALue, offset x days, minutes y

Mathematical Functions:

ABS(x); ABSolute value of x
ADD(x,y);x+y; ADD x and y
AVG(x1,x2, ... ,xn); AVeraGe of all non-blank values
COUNT(x1,x2, ... ,xn); COUNT of all non-blank values
DEFAULT(x,y); value y, or DEFAULT x if y is blank
DIST(x); standard normal DISTribution of value x
DIV(x,y); x/y; DIVide x by y
EXP(x); EXPonential of x, e^x
FACT(x); FACTorial of value x; 1*2*3*...*x
FIRST(x1,x2, ... ,xn); FIRST non-blank value
FRAC(x); FRACtional part of value x
IDIST(x); Inverse of standard normal DISTribution
INT(x); INTeger value of x
INTER(a,c,fa,fc,b); INTERpolated value fb
INV(x); INVersion of x, 1/x
LIMIT(x,y,z); LIMIT make value x >=y, <=z
LN(x); Natural Log of x

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LOG(x); LOG base 10 of x
LOG_REM(x,y); LOGarithm of REMoval, x in, y out
MAX(x1,x2, ... ,xn); MAXimum of all values
MIN(x1,x2, ... ,xn); MINimum of all values
MOD(x,y); x%y; MODulus or remainder of x/y
MUL(x,y); x*y; MULtiply x and y
NONBLANK(x); NONBLANK value of x
NONZERO(x); NON-ZERO value x, or blank if x is 0
PCT_REM(x,y); PerCenT REMoval, x in, y out
PREC(x,y); value x to y significant digits PRECision
PWR(x,y); x^y; x to the PoWeR of y
RAND(x); RANDom value less than x
ROUND(x,y); value x ROUNDed to y decimal places
ROUNDE(x,y); value x Even-biased ROUNDed to y places
SQRT(x); SQuare RooT of x
SUB(x,y); x-y; SUBtract y from x
SUM(x1,x2, ... ,xn); SUM of all non-blank values
TRUNC(x,y); TRUNCate value x to y decimal places
VERIFY(x,y,z); VERIFY value x >=y, <=z, else blank

Miscellaneous Functions:

ACCRUE([l:p],x); ACCRUE all values, offset x months
ACODE([l:p],x); numeric Alpha CODE, offset x days
ALPHA(ab); numeric ALPHA code representation for "ab"
APPLY(x,y); apply function 2 (y) to data in function 1 (x)
ASSIGN([l:p],x,y); ASSIGN value y, type x, to location:parameter
BIN(x); BINary value of x, expressed as an AlphaCode
BLANK(x); BLANK; data BLANK, no data exists
CT(x,y,z,w); disinfection CT (Concentration * Time) for temp, pH, Cl, LI
CTI(x,y,z,w); interpolated disinfection CT (Concentration * Time) for temp, pH, Cl, LI
CTR(x,y,z,w); Regression method disinfection CT (Concentration * Time) for temp, pH, Cl, LI
CVT(a:b,x); ConVerT value x from "abc" units to "def" units
CYL(x,y); CYLinder volume ratio, height x, diameter y
FAC(abc,x); value x from another FACility abc
FORMULA(abc); value from another FORMULA
HEX(x); HEXadecimal value of x, expressed as an AlphaCode
HLIME(x,y,z,w,v); Hydrated LIME required in mg/l
INCLUDE(fn,lp,x,y,z,m); INCLUDE location:parameter with calculated formula
LOOK(x,y1,y2, ... ,yn); LOOK up the xth value
NOTE(abc,x) = Note text abc is associated with the return the value x
ONCE(x,y); value y ONCE per month, on x'th day
ONCEW(x,y); value y ONCE per Week, on x'th day
OPTION(x,y,z,w); value x using OPTIONs for less than (y), greater than (z), or non-detect (w)
PRE_LMT(x,y); PREtreatment LiMiT, limit type x
QLIME(x,y,z,w,v); QuickLIME required in mg/l
RANGE(x1,y2,y3,...,yn); find RANGE of data
SETF(x,formula); SET an internal reference Formula
SETVAR(x,y); SET VARx variable to value y
SODA(x); SODA required in mg/l
SYNC(abc); SYNCronize location with facility abc

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TYPE(x,y); TYPE of data x, set type y
VAL(abc); VALue (and data type) of abc
WEIR(x,y,z); WEIR rectangular, gal/min for head x inches, width y ft, type z

Monthly Data Functions:

M_AVG([l:p],x,y,z,w); AVG, offset x months, type, rule, avg
M_COMP([l:p],x,y); offset x Days, COMPare offset y days
M_COUNT([l:p],x); COUNT of values, offset x months
M_COUNTH([l:p],x); COUNT of Hourly values, offset x months
M_DATE(x,y,z); Monthly DATE, offset x months, for month type y
M_GMEAN([l:p],x); Geometric MEAN, offset x months
M_MAX([l:p],x,y,z,w); MAX, offset x months, type, rule, avg
M_MED([l:p],x,y,z); Monthly MEDian, offset x months, type y, rule z
M_MIN([l:p],x,y,z,w); MIN, offset x months, type, rule, avg
M_NTH([l:p],x,y,z,n); NTH value, offset x months, type y, avg z, n
M_PCT([l:p],x,y,w,p); PerCenTile, offset x months, type y, avg w, % p
M_REM([l:p],x,y); Monthly percent REMoval, offset x months, type y
M_STAT([l:p],[l:p],x,y); Monthly STATistics, offset x months, type y
M_STDEV([l:p],x); STandard DEViation, offset x months
M_SUM([l:p],x); SUM of values, offset x months
M_SUM2([l:p],x,y,z,w); SUM, offset x months, type, rule, avg
M_SUMH([l:p],x); SUM of Hourly values, offset x months
M_TOTAL([l:p],x); TOTAL, offset x months, avg * days
M_TYPE([l:p],x,y); Monthly data TYPE, offset x months, range type y

OPC/DDE Functions:

DDE(a|b!c,x); DDE link, replacing char '?' with x
DDE_P(a|b|c,x,y) DDE Poke value y
DDE_X(a|b!c,x); DDE eXecute command c
OPC([a],b,c,x); OPC link for node a, server b, item c
OPC_W([a],b,c,x,y); OPC Write link for node a, server b, item c, integer x, value y

Process Section Data Functions:

ACCUM([l:p],x,y); ACCUMulate, offset x months, y days
S_AVG([l:p],x); AVG of process sections
S_SUM([l:p],x); SUM of process sections

Quarterly Data Functions:

Q_CSUM([l:p],x); Calendar Quarter SUM of daily values, offset x months
Q_SUM([l:p],x); Quarterly SUM of daily values, offset x months

Trigonometry Functions:

ACOS(x); ArcCOSine of x
ASIN(x); ArcSINe of x
ATAN(x); ArcTANgent of x
COS(x); COSine of x
CSC(x); CoSeCant of x

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SEC(x); SECant of x
SIN(x); SINe of x
TAN(x); TANgent of x

Violation Data Functions:

E_SUM([l:p],x,y,z,w,v); Exceedance SUM, offset, type, rule, avg, limit
V_AVG([l:p],x,y,z,w,v); offset, type, rule, avg, Violation AVG
V_CNT([l:p],x,y,z,w); offset, type, rule, Violation CouNT values
V_CNTP([l:p],x,y,z,w); offset, type Period, Violation CouNT values, month
V_DLY([l:p],x,y,z,w); DaiLY Violation, offset, type, max, min
V_DLYM([l:p],x,y,z,w); DaiLY Multiple Violation, offset, type, max, min
V_MAV([l:p],x,y,z,w,v); offset, type, rule, avg, Violation Min AVerage
V_MAX([l:p],x,y,z,w,v); offset, type, rule, avg, Violation MAX
V_MIN([l:p],x,y,z,w,v); offset, type, rule, avg, Violation MIN
SNC_CJP([l:p],x,y,z,w,v1,v2); offset, type, rule, avg, daily violation, avg violation
SNC_MAXD([l:p],x,y,z,w,v); offset, type, rule, avg, SNC violation MAX Daily
SNC_MAXM([l:p],x,y,z,w,v); offset, type, rule, avg, SNC violation MAX Monthly
SNC_MIND([l:p],x,y,z,w,v); offset, type, rule, avg, SNC violation MIN Daily
SNC_MINM([l:p],x,y,z,w,v); offset, type, rule, avg, SNC violation MIN Monthly

Weekly Data Functions:

W_AVG([l:p],x,y,z,w); Weekly AVG, offset x months, week, rule, avg
W_MAX([l:p],x,y,z,w); Weekly MAX, offset x months, week, rule, avg
W_MIN([l:p],x,y,z,w); Weekly MIN, offset x months, week, rule, avg

Yearly Data Functions:

Y_AVG([l:p],x,y,z); Yearly AVG Daily value, offset, months, type
Y_AVGM([l:p],x,y,z); Yearly AVG, Monthly average, offset, months, type
Y_CAVG([l:p],x,y); Calendar Year AVG of daily values, offset x months, type
Y_COUNT([l:p],x,y); Yearly COUNT of daily values, offset x months, for y months
Y_CSUM([l:p],x); Calendar Year SUM of daily values, offset x months
Y_MAX([l:p],x,y); Yearly MAX daily value, offset x months, for y months
Y_MAXM([l:p],x,y,z); Yearly MAX Monthly average, offset, months, type
Y_MIN([l:p],x,y); Yearly MIN daily value, offset x months, for y months
Y_MINM([l:p],x,y,z); Yearly MIN Monthly average, offset, months, type
Y_RES([l:p],x,y1,y2,y3,y4); Yearly RESidual, offset x years, percents y1, y2, y3, y4
Y_SUM([l:p],x,y); Yearly SUM of daily values, offset x months, for y months
Y_TOTM([l:p],x,y); Yearly sum of Monthly TOTals, offset x months, for y months

14.2 All Functions (alphabetically)

All Functions (alphabetically)

See also: All Functions (by groups)

A B C D E F G H I L M N O P Q R S T V W X Y

Data Types
Accessing Location:Parameter data values

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.45359 = .45359 (kg/lb as set in the OP10.CFG configuration file) (see also: Constants)
3.7853 = 3.7853 (liter/gal as set in the OP10.CFG configuration file) (see also: Constants)
8.34 = 8.34 (lb/gal as set in the OP10.CFG configuration file) (see also: Constants)

A

ABS(x); ABSolute value of x
ACCRUE([l:p],x); ACCRUE all values, offset x months
ACCUM([l:p],x,y); ACCUMulate, offset x months, y days
ACODE([l:p],x); numeric Alpha CODE, offset x days
ACOS(x); ArcCOSine of x
ADD(x,y);x+y; ADD x and y
ALPHA(ab); numeric ALPHA code representation for "ab"
AND(x,y); x&y; if x<>0 AND y<>0 then 1, else 0
APPLY(x,y); apply function 2 (y) to data in function 1 (x)
ASIN(x); ArcSINe of x
ASSIGN([l:p],x,y); ASSIGN value y, type x, to location:parameter
ATAN(x); ArcTANgent of x
AVG(x1,x2, ... ,xn); AVeraGe of all non-blank values

B

BIN(x); BINary value of x, expressed as an AlphaCode
BIT(x,y); if BIT x of y is 1 then 1, else 0
BLANK = BLANK (internally stored as -3.402823466e+38) (see also: Constants)
BLANK(x); BLANK; data BLANK, no data exists

C

Constants: ASK, BLANK, BEEP, TRUE, FALSE, pi, e , 8.3, 3.785, .45359
COS(x); COSine of x
COUNT(x1,x2, ... ,xn); COUNT of all non-blank values
CSC(x); CoSeCant of x
CT(x,y,z,w); disinfection CT (Concentration * Time) for temp, pH, Cl, LI
CTI(x,y,z,w); interpolated disinfection CT (Concentration * Time) for temp, pH, Cl, LI
CTR(x,y,z,w); Regression method disinfection CT (Concentration * Time) for temp, pH, Cl, LI
CVT(a:b,x); ConVerT value x from "abc" units to "def" units
CYL(x,y); CYLinder volume ratio, height x, diameter y

D

D_AVG([l:p],x,y); AVeraGe, offset x days, for y days
D_COMP([l:p],x,y); offset x Days, COMPare offset y days
D_COUNT([l:p],x,y); COUNT, offset x days, for y days
D_FLOW([l:p],x,y); FLOW value, offset x months, for y days
D_FWA([l:p],x); Flow-Weighted Avg, offset x days, for y days
D_GAUGE([l:p],[l:p],x,y); GAUGE value, supply l:p, offset x days, multiplier y
D_GMEAN([l:p],x,y); Geometric MEAN, offset x days, for y days
D_IGAUGE([l:p],[l:p],x,y); Interpolated GAUGE value, supply l:p, offset x days, multiplier y

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D_IMTR([l:p],x,y,z); Interpolated MeTeR value, offset x days, max meter reading y, multiplier z
D_INTER([l:p],x,y); INTERpolate from adjacent data, offset x days
D_LAST([l:p],x,y); LAST value not later than date, offset x months, y days
D_LASTN([l:p],x,y); average of LAST z Number of values not later than date, offset x months, y days
D_LASTNM([l:p],x,y,z); Median of LAST z Number of values not later than date, offset x months, y days
D_LASTNN([l:p],x,y,z,n); Nth highest of LAST z Number of values not later than date, offset x months, y days
D_LASTNP([l:p],x,y,z,w); wth Percentile of LAST z Number of values not later than date, offset x months, y days
D_LOADING([l:p],x,y); LOADING value, offset x months, for y days
D_MAX([l:p],x,y); MAXimum, offset x days, for y days
D_METER([l:p],x,y,z); METER value, offset x days, max meter reading y, multiplier z
D_MIN([l:p],x,y); MINimum, offset x days, for y days
D_NEXT([l:p],x,y); NEXT value not prior to date, offset x months, y days
D_STAT([l:p],[l:p],x,y,z); Daily STATistics, offset x days, for y days, type z
D_STDEV([l:p],x,y); STandard DEViation, offset x days, for y days
D_SUM([l:p],x,y); SUM, offset x days, for y days
D_TOTAL([l:p],x,y); avg * range, offset x days, for y days
D_VAL([l:p],x,y); VALue, offset x mon, y days
DATE([][j][m,d,y]); current, julian, or m/d/y DATE
DATE([j,x][m,d,y,x]); value x calculated on a julian or m/d/y DATE
DDE(a|b!c,x); DDE link, replacing char '?' with x
DDE_P(a|b|c,x,y) DDE Poke value y
DDE_X(a|b!c,x); DDE eXecute command c
DEFAULT(x,y); value y, or DEFAULT x if y is blank
DIST(x); standard normal DISTribution of value x
DIV(x,y); x/y; DIVide x by y
DOM(x); Day Of Month, 1-31, offset x days
DOW(x); Day Of Week, 1-7, offset x days
DOY(x); Day Of Year, 1-365, offset x days
DVAL(j,x); VALue x for the julian Date j

E

e = 2.718281828459045 (as set in the OP10.CFG configuration file) (see also: Constants)
E_SUM([l:p],x,y,z,w,v); Exceedance SUM, offset, type, rule, avg, limit
EQUAL(x,y); x=y; if x EQUALs y, 1, else 0
EXP(x); EXPonential of x, e^x

F

FAC(abc,x); value x from another FACility abc
FACT(x); FACTorial of value x; 1*2*3*...*x
FALSE = 0 (equal to 0) (see also: Constants)
FIRST(x1,x2, ... ,xn); FIRST non-blank value
FORMULA(abc); value from another FORMULA
FRAC(x); FRACtional part of value x

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G

GT(x,y); x>y; if x is Greater Than y, 1, else 0

H

H_AVG([l:p],x,y); Hourly AVeraGe, offset x days, hour y
H_CALC([l:p],x,y,z); Houlry CALCulations, value x, offset y days, type z
H_COMB([l:p],[l:p],x,y); COMBined Hourly, offset x days, type y
H_COUNT([l:p],x,y); Hourly COUNT, offset x days, hour y
H_FUNC([l:p],x,y,z); Hourly FUNCtion, offset x days, value y, type z
H_GMEAN([l:p],x,y); Hourly Geometric MEAN, offset x days, hour y
H_INTER([l:p],x,y); Hourly INTERpolate from adjacent data, offset x days, hour y
H_MAX([l:p],x,y,z); Hourly MAXimum, offset x days, hour y, option z
H_MED([l:p],x,y); Hourly MEDian, offset x days, hour y
H_METER([l:p],x,y,z); Hourly METER value, offset x days, max meter reading y, multiplier z
H_MIN([l:p],x,y,z); Hourly MINimum, offset x days, hour y, option z
H_PRTPWR([l:p],[l:p],x,y); Hourly PoWeR of PaRTicle counts, particle diameter X for first L:P, particle diameter Y for second L:P
H_STD([l:p],x,y); Hourly STandard Deviation, offset x days, hour y
H_SUM([l:p],x,y); Hourly SUM, offset x days, hour y
H_VAL([l:p],x,y); Hourly VALue, offset x days, minutes y
HLIME(x,y,z,w,v); Hydrated LIME required in mg/l

I

IDIST(x); Inverse of standard normal DISTribution
IF(x,y,z); IF x<>0 then y, else z
INCLUDE(fn,lp,x,y,z,m); INCLUDE location:parameter with calculated formula
INT(x); INTeger value of x
INTER(a,c,fa,fc,b); INTERpolated value fb
INV(x); INVersion of x, 1/x
ISALPHA([l:p],x); if value IS an ALPHA code then 1, else 0, offset x days
ISBLANK(x); if x IS BLANK then 1, else 0
ISDATA(x); if x IS valid DATA then 1, else 0
ISDATE([l:p],x); if value IS a DATE value then 1, else 0
ISFECAL([l:p]); if p IS a FECAL parameter then 1, else 0
ISFLOW([l:p]); if p IS a FLOW parameter then 1, else 0
ISGREAT([l:p],x); if value IS a GREATer than value then 1, else 0, offset x days
ISHR([l:p]); if l:p IS set for HouRly data entry then 1, else 0
ISLESS([l:p],x); if value IS a LESS than value then 1, else 0, offset x days
ISLP([l:p]); if L:P IS valid then 1, else 0
ISND([l:p],x); if value IS a Non-Detect value then 1, else 0, offset x days
ISTIME([l:p],x); if value IS a TIME value then 1, else 0, offset x days

L

LI(x,y,z,w,v,n1,n2); Log Inactivation
LIMIT(x,y,z); LIMIT make value x >=y, <=z
LN(x); Natural Log of x
LOG(x); LOG base 10 of x

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LOG_REM(x,y); LOGarithm of REMoval, x in, y out
LOM(x); Length Of Month 28-31, offset x months
LOOK(x,y1,y2, ... ,yn); LOOK up the xth value
LOY(x); Length Of Year 365-366, offset x years
LP(l,p); [l:p]; Location:Parameter data
LT(x,y); x<y; if x is Less Than y, 1, else 0

M

M_AVG([l:p],x,y,z,w); AVG, offset x months, type, rule, avg
M_COMP([l:p],x,y); offset x Days, COMPare offset y days
M_COUNT([l:p],x); COUNT of values, offset x months
M_COUNTH([l:p],x); COUNT of Hourly values, offset x months
M_DATE(x,y,z); Monthly DATE, offset x months, for month type y
M_GMEAN([l:p],x); Geometric MEAN, offset x months
M_MAX([l:p],x,y,z,w); MAX, offset x months, type, rule, avg
M_MED([l:p],x,y,z); Monthly MEDian, offset x months, type y, rule z
M_MIN([l:p],x,y,z,w); MIN, offset x months, type, rule, avg
M_NTH([l:p],x,y,z,n); NTH value, offset x months, type y, avg z, n
M_PCT([l:p],x,y,w,p); PerCenTile, offset x months, type y, avg w, % p
M_REM([l:p],x,y); Monthly percent REMoval, offset x months, type y
M_STAT([l:p],[l:p],x,y); Monthly STATistics, offset x months, type y
M_STDEV([l:p],x); STandard DEViation, offset x months
M_SUM([l:p],x); SUM of values, offset x months
M_SUM2([l:p],x,y,z,w); SUM, offset x months, type, rule, avg
M_SUMH([l:p],x); SUM of Hourly values, offset x months
M_TOTAL([l:p],x); TOTAL, offset x months, avg * days
M_TYPE([l:p],x,y); Monthly data TYPE, offset x months, range type y
MAX(x1,x2, ... ,xn); MAXimum of all values
MIN(x1,x2, ... ,xn); MINimum of all values
MOD(x,y); x%y; MODulus or remainder of x/y
MOY(x); Month Of Year, 1-12, offset x months
MUL(x,y); x*y; MULtiply x and y

N

NONBLANK(x); NONBLANK value of x
NONZERO(x); NON-ZERO value x, or blank if x is 0
NOT(x); if x is NOT equal to 0 then 1, else 0
NOTE(abc,x) = Note text abc is associated with the return the value x

O

ONCE(x,y); value y ONCE per month, on x'th day
ONCEW(x,y); value y ONCE per Week, on x'th day
OPC([a],b,c,x); OPC link for node a, server b, item c, integer x
OPC_W([a],b,c,x,y); OPC Write for node a, server b, item c, integer x, value y
OPTION(x,y,z,w); value x using OPTIONs for less than (y), greater than (z), or non-detect (w)
OR(x,y); x|y; if x<>0 OR y<>0, 1, else 0

P

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PCT_REM(x,y); PerCenT REMoval, x in, y out
pi = 3.141592653589793 (as set in the OP10.CFG configuration file) (see also: Constants)
PRE_LMT(x,y); PREtreatment LiMiT, limit type x
PREC(x,y); value x to y significant digits PRECision
PWR(x,y); x^y; x to the PoWeR of y

Q

Q_CSUM([l:p],x); Calendar Quarter SUM of daily values, offset x months
Q_SUM([l:p],x); Quarterly SUM of daily values, offset x months
QLIME(x,y,z,w,v); QuickLIME required in mg/l

R

RAND(x); RANDom value less than x
RANGE(x1,y2,y3,...yn); find RANGE of data
ROUND(x,y); value x ROUNDed to y decimal places
ROUNDE(x,y); value x Even-biased ROUNDed to y places

S

S_AVG([l:p],x); AVG of process sections
S_SUM([l:p],x); SUM of process section
SEC(x); SECant of x
SETF(x,formula); SET an internal reference Formula
SETVAR(x,y); SET VARx variable to value y
SIN(x); SINe of x
SNC_CJP([l:p],x,y,z,w,v1,v2); offset, type, rule, avg, daily violation, avg violation
SNC_MAXD([l:p],x,y,z,w,v); offset, type, rule, avg, SNC violation MAX Daily
SNC_MAXM([l:p],x,y,z,w,v); offset, type, rule, avg, SNC violation MAX Monthly
SNC_MIND([l:p],x,y,z,w,v); offset, type, rule, avg, SNC violation MIN Daily
SNC_MINM([l:p],x,y,z,w,v); offset, type, rule, avg, SNC violation MIN Monthly
SODA(x); SODA required in mg/l
SQRT(x); SQuare RooT of x
SUB(x,y); x-y; SUBtract y from x
SUM(x1,x2, ... ,xn); SUM of all non-blank values
SYNC(abc); SYNCronize location with facility abc

T

TAN(x); TANgent of x
TRUE = 1 (not equal to 0) (see also: Constants)
TRUNC(x,y); TRUNCate value x to y decimal places
TYPE(x,y); TYPE of data x, set type y

V

V_AVG([l:p],x,y,z,w,v); offset, type, rule, avg, Violation AVG
V_CNT([l:p],x,y,z,w); offset, type, rule, Violation CouNT values
V_CNTP([l:p],x,y,z,w); offset, type Period, Violation CouNT values, month
V_DLY([l:p],x,y,z,w); DaiLY Violation, offset, type, max, min
V_DLYM([l:p],x,y,z,w); DaiLY Multiple Violation, offset, type, max, min

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V_MAV([l:p],x,y,z,w,v); offset, type, rule, avg, Violation Min AVerage
V_MAX([l:p],x,y,z,w,v); offset, type, rule, avg, Violation MAX
V_MIN([l:p],x,y,z,w,v); offset, type, rule, avg, Violation MIN
VAL(abc); VALue (and data type) of abc
VAR1 through **VAR9** = variable set using SETVAR() (see also: Constants)
VERIFY(x,y,z); VERIFY value x >=y, <=z, else blank

W

W_AVG([l:p],x,y,z,w); Weekly AVG, offset x months, week, rule, avg
W_MAX([l:p],x,y,z,w); Weekly MAX, offset x months, week, rule, avg
W_MIN([l:p],x,y,z,w); Weekly MIN, offset x months, week, rule, avg
WDOM(x); WeekDay Of (1st of) Month, 1-7, offset x months
WEIR(x,y,z); WEIR rectangular, gal/min for head x inches, width y ft, type z
WOM(x); Week Of Month, 1-5, offset x days

X

XOR(x,y); if x OR y eXclusively then 1, else 0

Y

Y_AVG([l:p],x,y,z); Yearly AVG Daily value, offset, months, type
Y_AVGM([l:p],x,y,z); Yearly AVG, Monthly average, offset, months, type
Y_CAVG([l:p],x,y); Calendar Year AVG of daily values, offset x months, type
Y_COUNT([l:p],x,y); Yearly COUNT of daily values, offset x months, for y months
Y_CSUM([l:p],x); Calendar Year SUM of daily values, offset x months
Y_MAX([l:p],x,y); Yearly MAX daily value, offset x months, for y months
Y_MAXM([l:p],x,y,z); Yearly MAX Monthly average, offset, months, type
Y_MIN([l:p],x,y); Yearly MIN daily value, offset x months, for y months
Y_MINM([l:p],x,y,z); Yearly MIN Monthly average, offset, months, type
Y_RES([l:p],x,y1,y2,y3,y4); Yearly RESidual, offset x years, percents y1, y2, y3, y4
Y_SUM([l:p],x,y); Yearly SUM of daily values, offset x months, for y months
Y_TOTM([l:p],x,y); Yearly sum of Monthly TOTals, offset x months, for y months
YR(x); the YeaR, 1970-2037, offset x years

14.3 General Information

Topics in this section include:

- Data Types
- LP(l,p); [l:p] (Location:Parameter)

14.3.1 Data Types

Data Types

The **Data Type** represents the type of a single data item or the calculated result based on multiple data items. Data Types carry through multiple functions, and are often used for reporting final results on state forms. (For example, a monthly average may be considered a Less Than value if the month contains daily Less Than values)

In some cases, the Data Type cannot be logically established, and the result will revert to

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a Numeric Data Type. (For example, when adding a Less Than and a Greater Than value.) Most errors set the Data Type to 0, even though the result may be BLANK.

The Data Type is one of the following:

1 (1st bit set, bit 0) if the result is considered a Numeric value
2 (2nd bit set) if the result is considered a BLANK value
4 (3rd bit set) if the result is considered a Less Than value (<)
8 (4th bit set) if the result is considered an Alpha Code value
16 (5th bit set) if the result is considered a Greater Than value (>)
32 (6th bit set) if the result is considered a Non-Detect value (~)
64 (7th bit set) if the result is considered a Time value
128 (8th bit set) if the result is considered a Note value
256 (9th bit set) if the result is considered a Date value

Multiple Data Types usually produce:

Numeric with Alpha Code produces Numeric
Less Than with Numeric, Alpha Code, and/or Non-Detect produces **Less Than**
Greater Than with Numeric and/or Alpha Code produces **Greater Than**
Non-Detect with Numeric produces **Non-Detect**
Less Than and Greater Than with Numeric, Alpha Code, and/or Non-Detect produces **Numeric**
Time with any other Data Type produces **Time**
Date with any other Data Type produces **Date**
Blank with any other Data Type produces **Blank**
Notes have no effect unless they are the final result

Special cases or exceptions:

Subtraction, Division (second argument is inverted, for example: 20 - <5 = >15)
Flow Calculations (produce Numeric)
True/False Boolean (produce Numeric)
Sine, Cosine, Tangent, etc. (produce Numeric)
Count, Standard Deviation (produce Numeric)
Meter (produce Numeric)
Date Offsets, Violation Durations (produce Numeric)
Internal BioSolids Calculations (produce Numeric)
The Alpha Code "TNTC" is treated specially

14.3.2 LP(l,p); [l:p] (Location:Parameter

LP(l,p); [l:p]; LP(f:l,p); [f:l:p];

The data value of a specific **L**ocation and **P**arameter from the specified Facility for the current date

Value: The data value of a specific location and parameter from the specified facility for the current date of calculation.

> ***NOTE:*** The facility, location and parameter to which the formula is attached is used as a **Default Location and Parameter** for the following **Special Cases**:

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If f is **~** then the **Default Facility** is used

If l is **~** then the **Default Location** is used
If l is **?n** then a Process Section Location is used:
? for **Process Section Location**
?0 for **Process Location**
(returns **Section Flow** if p is ! (see below) or p is a flow parameter)
(returns **Section Loading** if p is a ~L parameter)
?1 to **?5** for **Location** n **of process section setup**
(as found in section setup)
?6 to **?8** for **Size** (n-5) (in english units) **of process section setup**
(as found in section setup)
?9 for **Effluent Location** of process
If l is **!** then the **Unit Multiplier** is returned for flow or concentration parameters
[**!**:flow_parname] returns the multiplier for mgal/day
[**!**:concentration_parname] returns the multiplier for mg/l

If l is **~CALC_LP** then the result of a reference formula is returned. This is especially useful within other functions which use [l:p] syntax as a data source, for example M_SUM([~CALC_LP:MyFormula],0) or Y_AVG([~CALC_LP:MyFormula],0,0,0)
If p is a **formula name** then the result of that formula is returned
If p is a **formula name** then the formula name must be no more than 16 characters in length
If p is ~~n (where n is a number from 1 to 99) then the result of the internal reference formula set by the SETF() function is returned. (see also: SETF())

> ***NOTE:*** **~CALC_LP** will only work in place of normal direct database access--not within functions which do not identify a specific date (such as D_LAST()), not within functions which modify data (such as those which calculate loadings), and *not* with hourly functions

If p is **~** then the **Default Parameter** is used
If p is **!** then the **Flow** for the current location is returned
(! or !m for mgal/day, !g for gal/day, !k for km3/day, !l for liter/day)
If p is **@** then the loading is returned (@ for lb, # for kg, assuming mg/l)
If p is **@parname** then the loading of parameter "parname" is returned (@ for lb, # for kg, assuming mg/l)
If p is **@@** or **@@parname** then the loading is returned (@ for lb, # for kg, & for g) (for mg/l, ug/l, ng/l, etc.)
If p is **$** then if the section (or BioSolids Site) is currently **In Service**,
TRUE (1) is returned; otherwise FALSE (0) is returned.
If p is **'n** then a BioSolids Site parameter is used:
'0 for **BioSolids Site size** in acres
'1 to **'4** for **User Defined Parameter** n of BioSolids Site
If p is **?** then **Base Parameter** is used (~A00000 becomes 00000)
If p is **?a** (where a=A toZ) then the parameter ~A00000 to ~Z00000 is used (even if the parameter is already ~?00000)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter ([f:l:p],[f:l_flow:p_flow])

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To return the stored data without conversion to a numeric type (to return an Alpha Code, for example):
add the additional parameter LP(f,l,p,1)

Examples:

[Sample Facility:Influent:50050] = 3.14 MGD Flow
LP(Sample Facility,Influent,50050) = 3.14
LP(Sample Facility,Influent,!) = 3.14
LP(~,~,!) = 3.14 when attached to location "Influent"

14.4 Boolean Functions

Topics in this section include:

- AND(x,y); x&y; if x<>0 AND y<>0 then 1, else 0
- BIT(x,y); if BIT x of y is 1 then 1, else 0
- EQUAL(x,y); x=y; if x EQUALs y, 1, else 0
- GT(x,y); x>y; if x is Greater Than y, 1, else 0
- IF(x,y,z); IF x<>0 then y, else z
- ISALPHA([l:p],x); if value IS an ALPHA code then 1, else 0, offset x days
- ISBLANK(x); if x IS BLANK then 1, else 0
- ISDATA(x); if x IS valid DATA then 1, else 0
- ISDATE([l:p],x); if value IS a DATE value then 1, else 0
- ISFECAL([l:p]); if p IS a FECAL parameter then 1, else 0
- ISFLOW([l:p]); if p IS a FLOW parameter then 1, else 0
- ISGREAT([l:p],x); if value IS a GREATer than value then 1, else 0, offset x days
- ISHR([l:p]); if l:p IS set for HouRly data entry then 1, else 0
- ISLESS([l:p],x); if value IS a LESS than value then 1, else 0, offset x days
- ISLP([l:p]); if L:P IS valid then 1, else 0
- ISND([l:p],x); if value IS a Non-Detect value then 1, else 0, offset x days
- ISTIME([l:p],x); if value IS a TIME value then 1, else 0, offset x days
- LT(x,y); x<y; if x is Less Than y, 1, else 0
- NOT(x); if x is NOT equal to 0 then 1, else 0
- OR(x,y); x|y; if x<>0 OR y<>0, 1, else 0
- XOR(x,y); if x OR y eXclusively then 1, else 0

14.4.1 AND(x,y)

AND(x,y); x&y

If x **AND** y are TRUE, then TRUE, else FALSE

Value: If x is TRUE (not equal to 0) and y is TRUE (not equal to 0), the value TRUE (1) is returned. If either x or y is FALSE (0) or BLANK, FALSE is returned.

Examples:

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AND(3.14,3) = 1
3.14&0 = 0

14.4.2 BIT(x,y)

BIT(x,y)

If **BIT** x of value y is 1, then TRUE, else FALSE

Value: If the bit (binary digit) x of value y is equal to 1, the value TRUE (1) is returned. If it is equal to 0, the value FALSE (0) is returned. If x is less than 0 or greater than 15, or y is negative or greater than 65535, the function returns BLANK.

Examples:

BIT(1,2) = 1 (bit 1 of binary 00000010)
BIT(0,5) = 1 (bit 0 of binary 00000101)
BIT(1,4) = 0 (bit 1 of binary 00000100)

14.4.3 EQUAL(x,y)

If x is **EQUAL** to y, then TRUE, else FALSE

Value: If x is equal to y, the value TRUE (1) is returned. If x is not equal to y, the value FALSE (0) is returned. If x and y are both BLANK, the function returns TRUE.

Examples:

EQUAL(3.14,3) = 0
3.14=3.14 = 1
EQUAL(BLANK,BLANK) = 1

14.4.4 GT(x,y)

GT(x,y); x>y

If x is **G**reater **T**han y, then TRUE, else FALSE

Value: If x is greater than y, the value TRUE (1) is returned. If x is less than or equal to y, the value FALSE (0) is returned. If y is BLANK and x is a value, the function returns TRUE. If x is BLANK, the function returns FALSE.

Examples:

GT(3.14,3) = 1
3.14>3.14 = 0

14.4.5 IF(x,y,z)

IF(x,y,z)

IF x is true, then y, else z

Value: If x is TRUE (not equal to 0), the value y is returned. If x is FALSE (equal to 0),

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the value z is returned. If x is BLANK, the function returns BLANK.

> ***NOTE:*** The value z is never processed when x is TRUE, the value y is never processed when x is FALSE.

Examples:

IF(1,3.14,10) = 3.14
IF(0,3.14,10) = 10

14.4.6 ISALPHA([l:p],x)

ISALPHA([l:p),x)

If the value, offset x days, **IS** an **ALPHA** code, then TRUE

Value: If the value of a specific location and parameter for the date x days from the current date is an Alpha Code, the value TRUE (1) is returned. Otherwise the function returns FALSE (0). The function considers only Alpha Codes--it ignores data, Less Than, Greater Than, or Non-Detect values.

Examples:

ISALPHA([Effluent:50050,0) = 1 if an Alpha Code, otherwise 0
ISALPHA([Effluent:50050,-1) = 1 if the previous day contained an Alpha Code

14.4.7 ISBLANK(x)

ISBLANK(x)

If x **IS BLANK** then TRUE

Value: If x is equal to BLANK, the value TRUE (1) is returned. Otherwise the function returns FALSE (0). The function considers only valid data--it ignores Alpha Codes, Less Than, Greater Than, or Non-Detect values (if Facility options are set to blank).

Examples:

ISBLANK(3.14) = 0
ISBLANK(BLANK) = 1

14.4.8 ISDATA(x)

ISDATA(x)

If x **IS** valid **DATA** then TRUE

Value: If x is a valid data value (non-BLANK), the value TRUE (1) is returned. Otherwise the function returns FALSE (0). The function considers only valid data--it ignores Alpha Codes, Less Than, Greater Than, or Non-Detect values (if Facility options are set to blank).

Examples:

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ISDATA(3.14) = 1
ISDATA(BLANK) = 0

14.4.9 ISDATE([l:p],x)

ISDATE([l:p),x)

If the value, offset x days, **IS** a **DATE** code, then TRUE

Value: If the value of a specific location and parameter for the date x days from the current date is a Date value, the value TRUE (1) is returned. Otherwise the function returns FALSE (0).

Examples:

ISALPHA([Effluent:50050,0) = 1 if a Date value, otherwise 0
ISALPHA([Effluent:50050,-1) = 1 if the previous day contained a Date value

14.4.10 ISFECAL([l:p])

ISFECAL([l:p])

If l:p **IS** a **FECAL** parameter then TRUE

Value: If parameter p is a fecal parameter, the value TRUE (1) is returned. Otherwise the function returns FALSE (0).

Examples:

ISFECAL([Effluent:31614]) = 1
ISFECAL([Effluent:50050]) = 0

14.4.11 ISFLOW([l:p])

ISFLOW([l:p])

If l:p **IS** a **FLOW** parameter then TRUE

Value: If parameter p is a flow parameter, the value TRUE (1) is returned. Otherwise the function returns FALSE (0).

Examples:

ISFLOW([Effluent:50050]) = 1
ISFLOW([Effluent:31614]) = 0

14.4.12 ISGREAT([l:p],x)

ISGREAT([l:p],x)

If the value, offset x days, **IS** a **GREAT**er than value, then TRUE

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Value: If the value of a specific location and parameter for the date x days from the current date is a Greater Than value, the value TRUE (1) is returned. Otherwise the function returns FALSE (0). The function considers only Greater Than values--it ignores data, Alpha Codes, Less Than, or Non-Detect values.

Examples:

ISGREAT([Effluent:50050,0) = 1 if a Greater Than value, otherwise 0
ISGREAT([Effluent:50050,-1) = 1 if the previous day contained a Greater Than value

14.4.13 ISHR([l:p])

ISHR([l:p])

If l:p **IS** set for **H**ou**R**ly data entry then TRUE

Value: If the location:parameter is set up for hourly data entry, the value TRUE (1) is returned. Otherwise the function returns FALSE (0).

Examples:

ISHR([Effluent:00400]) = 1
ISHR([Effluent:Daily]) = 0

14.4.14 ISLESS([l:p])

ISLESS([l:p],x)

If the value, offset x days, **IS** a **LESS** than value, then TRUE

Value: If the value of a specific location and parameter for the date x days from the current date is a Less Than value, the value TRUE (1) is returned. Otherwise the function returns FALSE (0). The function considers only Less Than values--it ignores data, Alpha Codes, Greater Than, or Non-Detect values.

Examples:

ISLESS([Effluent:50050,0) = 1 if a Less Than value, otherwise 0
ISLESS([Effluent:50050,-1) = 1 if the previous day contained a Less Than value

14.4.15 ISLP([l:p])

ISLP([l:p])

If l:p **IS** a valid **L**ocation and **P**arameter then TRUE

Value: If parameter p is a valid parameter for location l, the value TRUE (1) is returned. Otherwise the function returns FALSE (0).

Examples:

ISLP([Effluent:50050]) = 1
ISLP([Effluent:No Way]) = 0

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14.4.16 ISND([l:p],x)

ISND([l:p],x)

If the value, offset x days, **IS** a **N**on-**D**etect value, then TRUE

Value: If the value of a specific location and parameter for the date x days from the current date is a Non-Detect value, the value TRUE (1) is returned. Otherwise the function returns FALSE (0). The function considers only Non-Detect values--it ignores data, Alpha Codes, Less Than, or Greater Than values.

Examples:

ISND([Effluent:50050,0) = 1 if a Non-Detect value, otherwise 0
ISND([Effluent:50050,-1) = 1 if the previous day contained a Non-Detect value

14.4.17 ISTIME([l:p],x)

ISTIME([l:p],x)

If the value, offset x days, **IS** a **TIME** value, then TRUE

Value: If the value of a specific location and parameter for the date x days from the current date is a Time value, the value TRUE (1) is returned. Otherwise the function returns FALSE (0). The function considers only Time values--it ignores data, Alpha Codes, Less Than, Greater Than, or Non-Detect values.

Examples:

ISTIME([Effluent:50050,0) = 1 if a Time value, otherwise 0
ISTIME([Effluent:50050,-1) = 1 if the previous day contained a Time value

14.4.18 LT(x,y)

LT(x,y); x<y

If x is **L**ess **T**han y, then TRUE, else FALSE

Value: If x is less than y, the value TRUE (1) is returned. If x is greater than or equal to y, the value FALSE (0) is returned. If x is BLANK and y is a value, the function returns TRUE. If y is BLANK, the function returns FALSE.

Examples:

LT(3,3.14) = 1
3.14<3.14 = 0

14.4.19 NOT(x)

NOT(x)

NOT x

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Value: If x is TRUE (not equal to 0), FALSE(0) is returned. If x is FALSE (equal to 0), the value TRUE (1) is returned. If x is BLANK, the function returns BLANK.

Examples:

NOT(3.14) = 0
NOT(0) = 1

14.4.20 OR(x,y)

OR(x,y); x|y

If x **OR** y is TRUE, then TRUE, else FALSE

Value: If either x or y is TRUE (not equal to 0), the value TRUE (1) is returned. If both x and y are FALSE (equal to 0) or BLANK, FALSE (0) is returned.

Examples:

OR(3.14,3) = 1
3.14|0 = 1

14.4.21 XOR(x,y)

XOR(x,y)

If x **OR** y is e**X**clusively TRUE, then TRUE, else FALSE ("exclusive or")

Value: If either x is TRUE (not equal to 0) and y is FALSE (equal to 0), or y is TRUE and x is FALSE, the value TRUE (1) is returned. Otherwise FALSE (0) is returned. If either x or y is BLANK, the function returns FALSE.

Examples:

XOR(3.14,3) = 0
XOR(3.14,0) = 1

14.5 Constants

Topics in this section include:

- Constants
- BLANK(x)
- VAR0-9

14.5.1 Constants

Constants

Value: Several Constants may be specified in formulas, and the actual values will be used during calculation:

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BLANK = BLANK (the absence of any valid data)
VAR0 through **VAR9** = variable set using SETVAR()
TRUE = 1 (not equal to 0)
FALSE = 0 (equal to 0)
NOW = the current system date (NOT the current date of the calculation!) as a julian date value; see: Date Functions
pi = 3.141592653589793 (as set in the OP10.CFG configuration file)
e = 2.718281828459045 (as set in the OP10.CFG configuration file)
8.34 = 8.34 (lb/gal as set in the OP10.CFG configuration file)
3.7853 = 3.7853 (liter/gal as set in the OP10.CFG configuration file)
.45359 = .45359 (kg/lb as set in the OP10.CFG configuration file)

NOTE: The special Alpha Code "TNTC" is treated as BLANK in most calculations, but produces a Greater Than type as a result. However when considered in monthly maximum or violation functions it is treated as an infinitely large value. When returned as a result, it is usually preserved as the Alpha Code "TNTC".

Several Functions are associated with constants:

BLANK(x) = BLANK (ignores x)
SETVAR(x,y) = sets variable VARx

14.5.2 BLANK(x)

BLANK(x); BLANK

BLANK returns BLANK

Value: The value BLANK is returned. The value x is calculated, but the value is ignored. BLANK is defined as the absence of any valid data.

NOTE: Most functions assume BLANK for unentered values. For example "IF([I:p],100,)" assumes "IF([I:p],100,BLANK)".

Examples:

BLANK = no data value
BLANK(SHOW(MONTH LENGTH IS:,LOM(0))) = Shows the month length, but does not return a value

14.5.3 VAR0-9

SETVAR(x,y);

SET VARx variable to value y

Value: The previous value of the variable is returned. The ten available variables are named "VAR0" through "VAR9". By specifying an x value of 0 to 9, each may be set to the value y. The value y may be BLANK. Variables "VAR0" through "VAR9" may be used in any formula to represent the value.

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NOTE: **VARx variables are shared for ALL Facilities and users** of the OP10 application. The values are saved even when the application is exited. The variables only change when given a new value using SETVAR().

Examples:

SETVAR(0,45.1) = the previous value of VAR0. VAR0 will now be 45.1
SETVAR(2,BLANK) = clears the value of VAR2
[RawWW:50050]*VAR4 = the flow multiplied by the (previously set) variable VAR4

14.6 Daily Data Functions

Topics in this section include:

- D_AVG([l:p],x,y); AVeraGe, offset x days, for y days
- D_COMP([l:p],x,y); offset x Days, COMPare offset y days
- D_COUNT([l:p],x,y); COUNT, offset x days, for y days
- D_FLOW([l:p],x,y); FLOW value, offset x months, for y days
- D_FWA([l:p],x); Flow-Weighted Avg, offset x days, for y days
- D_GAUGE([l:p],[l:p],x,y); GAUGE value, supply l:p, offset x days, multiplier y
- D_GMEAN([l:p],x,y); Geometric MEAN, offset x days, for y days
- D_IGAUGE([l:p],[l:p],x,y); Interpolated GAUGE value, supply l:p, offset x days, multiplier y
- D_IMTR([l:p],x,y,z); Interpolated MeTeR value, offset x days, max meter reading y, multiplier z
- D_INTER([l:p],x); INTERpolate from adjacent data, offset x days
- D_LAST([l:p],x,y); LAST value not later than date, offset x months, y days
- D_LASTN([l:p],x,y,z); average of LAST z Number of values not later than date, offset x months, y days
- D_LASTNM([l:p],x,y,z); Median of LAST z Number of values not later than date, offset x months, y days
- D_LASTNN([l:p],x,y,z,n); Nth highest of LAST z Number of values not later than date, offset x months, y days
- D_LASTNP([l:p],x,y,z,w); wth Percentile of LAST z Number of values not later than date, offset x months, y days
- D_LOADING([l:p],x,y); LOADING value, offset x months, for y days
- D_MAX([l:p],x,y); MAXimum, offset x days, for y days
- D_METER([l:p],x,y,z); METER value, offset x days, max meter reading y, multiplier z
- D_MIN([l:p],x,y); MINimum, offset x days, for y days
- D_NEXT([l:p],x,y); NEXT value not prior to date, offset x months, y days
- D_STAT([l:p],[l:p],x,y,z); Daily STATistics, offset x days, for y days, type z
- D_STDEV([l:p],x,y); STandard DEViation, offset x days, for y days
- D_SUM([l:p],x,y); SUM, offset x days, for y days
- D_TOTAL([l:p],x,y); avg * range, offset x days, for y days
- D_VAL([l:p],x,y); VALue, offset x mon, y days

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- LP(l,p); [l:p]; Location:Parameter data
- LOG_REM(x,y); LOGarithm of REMoval, x in, y out
- PCT_REM(x,y); PerCenT REMoval, x in, y out

14.6.1 D_AVG([l:p],x,y)

D_AVG([l:p],x,y)

Daily **AV**era**G**e for location and parameter, offset x days, for y days

Value: The average of data values of a specific location and parameter for the date x days from the current date and extending for a range of y days.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter D_AVG([l:p],[l_flow:p_flow],x,y)

Examples:

D_AVG([Effluent:50050],-7,7) = average of past 7 days
D_AVG([Effluent:50050],-3,7) = average of week beginning 3 days ago

14.6.2 D_COMP([l:p],x,y)

D_COMP([l:p],x,y)

Daily **COMP**are for location and parameter, offset x days, offset y days

Value: The difference in data values for a specific location and parameter, comparing the date x days from the current date to the date y days from the current date.

Examples:

D_COMP([Effluent:50050],0,-7) = increase for past week (since 7 days ago)
D_COMP([Effluent:50050],-3,3) = increase for week beginning 3 days ago

14.6.3 D_COUNT([l:p],x,y)

D_COUNT([l:p],x,y)

Daily **COUNT** for location and parameter, offset x days, for y days

Value: The count of data values of a specific location and parameter for the date x days from the current date and extending for a range of y days. The function counts only valid data--it ignores Alpha Codes, Less Than, Greater Than, or Non-Detect values (if Facility options are set to blank).

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter D_COUNT([l:p],[l_flow:p_flow],x,y)

Examples:

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D_COUNT([Effluent:50050],-7,7) = count of past 7 days
D_COUNT([Effluent:50050],-3,7) = count of week beginning 3 days ago

14.6.4 D_FLOW([l:p],x,y)

D_FLOW([l:p],x,y)

Daily **FLOW** for location and parameter, offset x months, for y days

Value: The flow value in MG/D for any location, including a process or section. The value p is ignored (use ~).

An additional parameter z may be added to return:
1 for gal/d
2 for km3/d
3 for l/d

Examples:

D_FLOW([Effluent:~],0,0) = flow value today
D_FLOW([Effluent:~],-3,0) = flow value from 3 months ago
D_FLOW([Effluent:~],0,0,1) = flow value from today, converted to gallons per day

14.6.5 D_FWA([l:p],x)

D_FWA([l:p],x,y)

Daily **F**low-**W**eighted **A**verage for location and parameter, offset x days, for y days

Value: The flow-weighted average of data values of a specific location and parameter for the date x days from the current date and extending for a range of y days. Data values where either the parameter or the flow is BLANK are ignored. (see also: Flow-Weighted Average in the main Synexus application)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter D_FWA([l:p],[l_flow:p_flow],x,y)

Examples:

D_FWA([Effluent:50050],-7,7) = flow-weighted average of past 7 days
D_FWA([Effluent:50050],-3,7) = flow-weighted average of week beginning 3 days ago

14.6.6 D_GAUGE([l:p],[l:p],x,y)

D_GAUGE([l:p],[l:p],x,y)

Daily **GAUGE** value for location and parameter, supply value from second location and parameter, multiplier y, offset x days

Value: The value calculated from the decrease in gauge reading at a specific location and parameter. The function uses the gauge data from the date x days from the current date,

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the last data prior to that date, an additional supply value from the date x days from the current date, and a multiplier. It returns the change in gauge reading, multiplied by the multiplier value, less the added supply. The function considers only valid data, and will return BLANK if there is no valid gauge data for the current or past dates.

NOTE: The supply value location and parameter is optional, and may be left blank.

NOTE: The function may also be used for gauges that increase, by specifying a negative value for the multiplier y.

Examples:

D_GAUGE([Effluent:M92225],[Effluent:CL2 Tank],0,1000) change in gauge reading, multiplied by 1000, with CL2 supply
D_GAUGE([Effluent:M92225],,0,1) = change in gauge reading (no multiplier, no supply)

14.6.7 D_GMEAN([l:p],x,y)

D_GMEAN([l:p],x,y)

Daily **G**eometric **MEAN** for location and parameter, offset x days, for y days (equivalent to logarithmic mean)

Value: The geometric mean of data values of a specific location and parameter for the date x days from the current date and extending for a range of y days. Data values less than 0 are ignored. The function is equivalent to a logarthmic mean (A logarithmic mean returns the same value, although it may use a different calculation method).

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter D_GMEAN([l:p],[l_flow:p_flow],x,y)

Examples:

D_GMEAN([Effluent:50050],-7,7) = geometric mean of past 7 days
D_GMEAN([Effluent:50050],-3,7) = geometric mean of week beginning 3 days ago

14.6.8 D_IGAUGE([l:p],[l:p],x,y)

D_IGAUGE([l:p],[l:p],x,y)

Daily **I**nterpolated **GAUGE** value for location and parameter, supply value from second location and parameter, multiplier y, offset x days

Value: The value calculated from the decrease in gauge reading at a specific location and parameter. The function uses the gauge data from the date x days from the current date, the last data prior to that date, an additional supply value from the date x days from the current date, and a multiplier. It returns the interpolated change in gauge reading, multiplied by the multiplier value, less the added supply. The function considers only valid data, and will return BLANK if there is no valid gauge data for the current or past dates.

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NOTE: The supply value location and parameter is optional, and may be left blank.

NOTE: The function may also be used for gauges that increase, by specifying a negative value for the multiplier y.

Examples:

D_IGAUGE([Effluent:M92225],[Effluent:CL2 Tank],0,1000) change in gauge reading, multiplied by 1000, with CL2 supply
D_IGAUGE([Effluent:M92225],,0,1) = change in gauge reading (no multiplier, no supply)

14.6.9 D_IMTR([l:p],x,y,z)

D_IMTR([l:p],x,y,z)

Daily **I**nterpolated **M**e**T**e**R** value for location and parameter, maximum meter reading y, multiplier z, offset x days

Value: The value calculated from the positive change in meter reading at a specific location and parameter. The function uses the meter data from or following the date x days from the current date, the last data prior to that date, the maximum possible whole number meter reading, and a multiplier. It returns the interpolated change in meter reading, multiplied by the multiplier value. The function considers only valid data, and will return BLANK if there is no valid meter data for the future or past dates.

NOTE: The function may also be used for meters that count down, by specifying a negative value for the maximum meter reading y.

Examples:

D_IMTR([Effluent:M92225],0,99999,.001) interpolated change in meter reading, divided by 1000
D_IMTR([Effluent:M92225],0,999,1) = interpolated change in meter reading (no multiplier)

14.6.10 D_INTER([l:p],x)

D_INTER([l:p],x)

Daily **INTER**polation of adjacent data for location and parameter, offset x days

Value: The interpolated data value for a specific location and parameter for the date x days from the current date. If a value exists for the the date, it is returned. Otherwise the function considers the last data (the last data not later than the date) and the next data (the next data not prior to the date), and returns an interpolated (linear) value. If there are no valid last or next values, the function returns BLANK.

Examples:

D_INTER([Effluent:50050],0) = value interpolated from adjacent values

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14.6.11 D_LAST([l:p],x,y)

D_LAST([l:p],x,y)

Daily **LAST** value for location and parameter, offset x months and y days

Value: The data value of a specific location and parameter equal to or prior to the date x months and y days from the current date (the last data not later than the date). The function considers only valid data, and will return BLANK if there is no valid data equal to or earlier than the date.

The function will return the number of days to the previous value by adding 256 to the month x.

Examples:

D_LAST([Effluent:50050],-1,0) = value one month ago or earlier
D_LAST([Effluent:50050],0,-7) = value one week ago or earlier

14.6.12 D_LASTN([l:p],x,y,z)

D_LASTN([l:p],x,y,z)

Daily average of **LAST** z **N**umber of values for location and parameter, offset x months and y days

Value: The average of z number of data values of a specific location and parameter equal to or prior to the date x months and y days from the current date (the last data values not later than the date). The function considers only valid data, and will return BLANK if there is no valid data equal to or earlier than the date. If z is less than or equal to zero, the function returns BLANK. If z is 1, the function returns the same value as D_LAST().

The average Loading may be returned by adding the additional parameter D_LASTN([l:p],x,y,z,1)

A Geometric Mean may be returned instead of an average by adding the additional parameter D_LASTN([l:p],x,y,z,2)

Examples:

D_LASTN([Effluent:50050],-1,0,2) = average of two values one month ago or earlier
D_LASTN([Effluent:50050],0,-7,1) = value one week ago or earlier

14.6.13 D_LASTNM([l:p],x,y,z)

D_LASTNM([l:p],x,y,z)

Daily **M**edian of **LAST** z **N**umber of values for location and parameter, offset x months and y days

Value: The median of z number of data values of a specific location and parameter equal to or prior to the date x months and y days from the current date (the last data values not later than the date). In the distribution of data values, the middle value is returned. Where there are an even number of values, the average (arithmetic mean) of the two

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middle values is returned. The function considers only valid data, and will return BLANK if there is no valid data equal to or earlier than the date. If z is less than or equal to zero, the function returns BLANK.

The median Loading may be returned by adding the additional parameter
D_LASTNM([l:p],x,y,z,1)

Examples:

D_LASTNM([Effluent:50050],-1,0,7) = median of seven values one month ago or earlier

14.6.14 D_LASTNN([l:p],x,y,z)

D_LASTNN([l:p],x,y,z,n)

Daily **N**th value of **LAST** z **N**umber of values for location and parameter, offset x months and y days

Value: The Nth data value of z number of data values of a specific location and parameter equal to or prior to the date x months and y days from the current date (the last data values not later than the date). The values are ordered from minimum to maximum, and the nth highest value is returned. (For instance, if the data values are 6, 2, 5, 8, and 3, the 4th value would be 6.) If -n is used, the values are ordered from maximum to minimum, and the nth lowest value is returned. If n is blank, zero, or greater than the number of data values, the function returns BLANK. The function considers only valid data, and will return BLANK if there is no valid data equal to or earlier than the date. If z is less than or equal to zero, the function returns BLANK.

The Nth Loading may be returned by adding the additional parameter
D_LASTNN([l:p],x,y,z,n,1)

Examples:

D_LASTNN([Effluent:50050],-1,0,7,2) = 2nd of seven values one month ago or earlier

14.6.15 D_LASTNP([l:p],x,y,z,w)

D_LASTNP([l:p],x,y,z,w)

Daily **P**ercentile of **LAST** z **N**umber of values for location and parameter, offset x months and y days, percent w

Value: The w-th percentile of z number of data values of a specific location and parameter equal to or prior to the date x months and y days from the current date (the last data values not later than the date). The function considers only valid data, and will return BLANK if there is no valid data equal to or earlier than the date. In the distribution of data values into 100 groups having equal frequencies: w percent of the values lie at or below the w-th percentile. If z is less than or equal to zero, the function returns BLANK.

The w-th percentile Loading may be returned by adding the additional parameter
D_LASTNP([l:p],x,y,z,w,1)

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Examples:

D_LASTNP([Effluent:50050],-1,0,7,70) = 70th percentile of seven values one month ago or earlier

14.6.16 D_LOADING([l:p],x,y)

D_LOADING([l:p],x,y)

Daily **LOADING** for location and parameter, offset x months, for y days

Value: The loading value in pounds per day (LB/D) for any location, including a process or section. The function always uses the base parameter.

A second Location:Parameter may be used to specify the flow location:
D_LOADING([l:p],[l:p],x,y) The flow value p is ignored (use ~).

The optional parameter z may be added to return:
1 for kg/d
2 for g/d

Examples:

D_LOADING([Effluent:BOD 5],0,0) = loading value for BOD 5 at the Effluent location. (Assumes flow parameter exists at location.)
D_LOADING([Effluent:BOD 5],[Influent:~],-3,0) = loading value for BOD 5 at the Effluent location, using the Influent location for Flow.
D_LOADING([Effluent:BOD 5],0,0,1) = loading value for BOD 5 at the Effluent location in kilograms per day (KG/D)

14.6.17 D_MAX([l:p],x,y)

D_MAX([l:p],x,y)

Daily **MAX**imum for location and parameter, offset x days, for y days

Value: The maximum of data values of a specific location and parameter for the date x days from the current date and extending for a range of y days.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter D_MAX([l:p],[l_flow:p_flow],x,y)

Examples:

D_MAX([Effluent:50050],-7,7) = maximum of past 7 days
D_MAX([Effluent:50050],-3,7) = maximum of week beginning 3 days ago

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14.6.18 D_METER([l:p],x,y,z)

D_METER([l:p],x,y,z)

Daily **METER** value for location and parameter, maximum meter reading y, multiplier z, offset x days

Value: The value calculated from the positive change in meter reading at a specific location and parameter. The function uses the meter data from the date x days from the current date, the last data prior to that date, the maximum possible whole number meter reading, and a multiplier. It returns the change in meter reading, multiplied by the multiplier value. The function considers only valid data, and will return BLANK if there is no valid meter data for the current or past dates.

> ***NOTE:*** The function may also be used for meters that count down, by specifying a negative value for the maximum meter reading y.

Examples:

D_METER([Effluent:M92225],0,99999,.001) change in meter reading, divided by 1000
D_METER([Effluent:M92225],0,999,1) = change in meter reading (no multiplier)

14.6.19 D_MIN([l:p],x,y)

D_MIN([l:p],x,y)

Daily **MIN**imum for location and parameter, offset x days, for y days

Value: The minimum of data values of a specific location and parameter for the date x days from the current date and extending for a range of y days.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter D_MIN([l:p],[l_flow:p_flow],x,y)

Examples:

D_MIN([Effluent:50050],-7,7) = minimum of past 7 days
D_MIN([Effluent:50050],-3,7) = minimum of week beginning 3 days ago

14.6.20 D_NEXT([l:p],x,y)

D_NEXT([l:p],x,y)

Daily **NEXT** value for location and parameter, offset x months and y days

Value: The data value of a specific location and parameter equal to or later than the date x months and y days from the current date (the first data not prior to the date). The function considers only valid data, and will return BLANK if there is no valid data equal to or later than the date.

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The function will return the number of days to the next value by adding 256 to the month x.

Examples:

D_NEXT([Effluent:50050],1,0) = value one month ahead or later
D_NEXT([Effluent:50050],0,-7) = value one week ago or later

14.6.21 D_STAT([l:p],[l:p],x,y,z)

D_STAT([l:p],[l:p],x,y,z)

Daily **STAT**istics values for location(s) and parameter(s), offset x days, for y days, type z

Value: The statistics result for data values of specific location(s) and parameter(s) for the date x days from the current date and extending for a range of y days. If two locations and parameters are used, data values where either is BLANK are ignored. If the second location:parameter is not needed, it may be left BLANK.

The type z determines the result, where:

z = 0 n , the **number** (count) of values (either one or two location:parameters may be used)

z = 1 $\sum x$, the **Sum** of the values (one location:parameter)

z = 2 $\sum x^2$, the **Sum** of the values squared (one location:parameter)

z = 3 $V_x = \frac{\sum\left(x - \frac{\sum x}{n}\right)^2}{n-1}$, the **Sample Variance** of the values (one location:parameter)

z = 4 $S_x = \sqrt{V_x}$, the **Sample Standard Deviation** of the values (one location:parameter)

z = 5 $SS_x = \sum\left(x - \frac{\sum x}{n}\right)^2$, the **Sum of the Squares of the Deviations** of the values (one location:parameter)

z = 6 $CI_x = 1.96\sqrt{\frac{V_x}{n}}$, the **Confidence Interval** (95%) of the values (assumes large n) (one location:parameter)

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z = 7 $\sum_{xy}$, the **Sum of the Products** of the first and second location:parameter

z = 8 $C_{xy} = \frac{SS_{xy}}{n}$, the **Covariance** of the values

z = 9 $SS_{xy} = \sum\left(x - \frac{\sum x}{n}\right)\left(y - \frac{\sum y}{n}\right)$, the **Sum of the Products of the Deviations** of the values

z = 10 $b = \frac{SS_{xy}}{SS_x}$, the **Slope** of the sample Linear Regression line

z = 11 $a = \frac{\sum y - b\sum x}{n}$, the **y Intercept** of the sample Linear Regression line

z = 12 $r = \frac{SS_{xy}}{\sqrt{SS_x SS_y}}$, the **Correlation Coefficient** of the values

z = 13 $r2 = r^2$, the **Coefficient of Determination** of the values

z = 14 $V_x = \frac{\sum\left(x - \frac{\sum x}{n}\right)^2}{n}$, the **Population Variance** of the values (one location:parameter)

z = 15 $S_x = \sqrt{V_x}$, the **Population Standard Deviation** of the values (one location:parameter)

Examples:

D_STAT([Inf Dom:50050],BLANK,-7,7,1) = sum of past 7 days
D_STAT([Inf Dom:50050],[Inf Ind:50050],0,7,8) = Covariance for the week

14.6.22 D_STDEV([l:p],x,y)

D_STDEV([l:p],x,y)

Daily **ST**andard **DEV**iation for location and parameter, offset x days, for y days

Value: The standard deviation of data values of a specific location and parameter for the

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date x days from the current date and extending for a range of y days.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter D_STDEV([l:p],[l_flow:p_flow],x,y)

Examples:

D_STDEV([Effluent:50050],-7,7) = standard deviation of past 7 days
D_STDEV([Effluent:50050],-3,7) = standard deviation of week beginning 3 days ago

14.6.23 D_SUM([l:p],x,y)

D_SUM([l:p],x,y)

Daily **SUM** for location and parameter, offset x days, for y days

Value: The sum of data values of a specific location and parameter for the date x days from the current date and extending for a range of y days.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter D_SUM([l:p],[l_flow:p_flow],x,y)

Examples:

D_SUM([Effluent:50050],-7,7) = sum of past 7 days
D_SUM([Effluent:50050],-3,7) = sum of week beginning 3 days ago

14.6.24 D_TOTAL([l:p],x,y)

D_TOTAL([l:p],x,y)

Daily **TOTAL** for location and parameter, offset x days, for y days (average * number of days)

Value: The total of data values of a specific location and parameter for the date x days from the current date and extending for a range of y days. The total is defined as the average of values, multiplied by the number of days in the range.

Examples:

D_TOTAL([Effluent:50050],-7,7) = total of past 7 days
D_TOTAL([Effluent:50050],-3,7) = total of week beginning 3 days ago

14.6.25 D_VAL([l:p],x,y)

D_VAL([l:p],x,y)

Daily **VAL**ue for location and parameter, offset x months and y days

Value: The data value of a specific location and parameter for the date x months and y days from the current date.

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Examples:

D_VAL([Effluent:50050],-1,0) = value last month
D_VAL([Effluent:50050],0,-7) = value last week

14.7 Date Functions

Topics in this section include:

- DATE([][j][m,d,y]); current, julian, or m/d/y DATE
- DATE([j,x][m,d,y,x]); value x calculated on a julian or m/d/y DATE
- DOM(x); Day Of Month, 1-31, offset x days
- DOW(x); Day Of Week, 1-7, offset x days
- DOY(x); Day Of Year, 1-365, offset x days
- DVAL(j,x); VALue x for the julian Date j
- LOM(x); Length Of Month 28-31, offset x months
- LOY(x); Length Of Year 365-366, offset x years
- M_DATE(x,y,z); Monthly DATE, offset x months, for month type y
- MOY(x); Month Of Year, 1-12, offset x months
- WDOM(x); WeekDay Of (1st of) Month, 1-7, offset x months
- WOM(x); Week Of Month, 1-5, offset x days
- YR(x); the YeaR, 1970-2037, offset x years

14.7.1 DATE([][j][m,d,y])

DATE([][j][m,d,y])

current, julian, or m/d/y **DATE**

Value: The numeric date value calculated from the specified information and returned as a (julian) date value. Julian dates are expressed in days since 1/1/4713 B.C.

if DATE() is specified, then the current date is returned.
if DATE(j) is specified, then the date returned is based on the julian value.
if DATE(m,d,y) is specified, then the date returned is based on the month, day, and year. The value y may be either a two or four digit year. Any value may be omitted to use the month, day, or year of the current date. (For example: "DATE(1,1,)" = January 1 of the current year.)

The resultant date may be used in further calculations:

using addition or subtraction with any numeric value will add a number of days to the (julian) date value; for example: "DATE() - 7" = the date one week prior.
using subtraction with two (julian) date values will return the difference in days as a numeric value; for example: "DATE() - DATE(1,1,)" = the number of days since the beginning of the year.

Example:

DATE() = the current calculation date

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DATE(2458850) = the date of January 1, 2020
DATE(1,1,2020) = the date of January 1, 2020
DATE(MOY()-1,,) = the date of the same day last month

14.7.2 DATE([j,x][m,d,y,x])

DATE([j,x][m,d,y,x])

the value x calculated on a julian or m/d/y **DATE**

Value: The value x calculated on a particular date given by the specified information.

if DATE(j,x) is specified, then the value x is returned for the date based on the julian value.
if DATE(m,d,y) is specified, then the value x is returned for the date returned is based on the month, day, and year. The value y may be either a two or four digit year. Any value may be omitted to use the month, day, or year of the current date. (For example: "DATE(1,1,,x)" = the value on January 1 of the current year.)

Example:

DATE(2458850,[Plant Eff:Flow MGD]) = the value on January 1, 2020
DATE(1,1,2020,[Plant Eff:Flow MGD]) = the value on January 1, 2020
DATE(MOY()-1,,,D_AVG([Plant Eff:BOD 5],-3,7)) = the value calculated on the same day last month

14.7.3 DOM(x)

DOM(x)

Day **O**f the **M**onth, offset x days

Value: The numeric value (1 to 31) of the day of the month, for the date x days from the current date.

Example:

DOM(0) = current day of the month

14.7.4 DOW(x)

DOW(x)

Day **O**f the **W**eek, offset x days

Value: The numeric value (1 to 7) of the day of the week, for the date x days from the current date.

Example:

DOW(0) = current day of the week

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14.7.5 DOY(x)

DOY(x)

Day **O**f the **Y**ear, offset x days

Value: The numeric value (1 to 365 (or 366)) of the day of the year, for the date x days from the current date.

Example:

DOY(0) = current day of the year

14.7.6 DVAL(j,x)

DVAL(j,x)

VALue x for the julian **D**ate j

Value: The numeric value x calculated for the date specified by j instead of the current date. The value j may be from either a data value or the result of the DATE() or VAL() functions.

Example:

DVAL([Raw WW:TestDate],[Raw WW:50050]) = flow value for the date specified in a DataView
DVAL(201108010000,[Raw WW:50050]) = daily flow value for August 1, 2011 (using the AllMax Software date format YYYYMMDDHHMM)
DVAL(VAL(01/01/2020),[Raw WW:50050]) = flow value for January 1, 2020
DVAL(DATE(,,YR(-1)),[Raw WW:50050]) = flow value for the same day last year

14.7.7 LOM(x)

LOM(x)

Length **O**f the **M**onth, offset x months

Value: The numeric value (28 to 31) of the length of the month x months from the current month.

Examples:

LOM(0) = length of the current month
LOM(-1) = length of the previous month

14.7.8 LOY(x)

LOY(x)

Length **O**f the **Y**ear, offset x years

Value: The numeric value (365 to 366) of the length of the year x years from the current year.

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Examples:

LOY(0) = length of the current year
LOY(-1) = length of the previous year

14.7.9 M_DATE(x,y,z)

M_DATE(x,y,z)

Monthly **DATE**, offset x months, for month type y, return type z

Value: The numeric date value, offset, or length for the month x months from the current month.

if y is 0 then the result uses a calendar month
if y is 1 then a week falls in the month which contains its Saturday
if y is 2 then a week falls in the month which contains its Wednesday
if y is 3 then the result uses the first of month, for 4 weeks, 28 days
if y is 4 then the first of month 4th week extends to the end of the month
(the value 5 is unused, for compatibility with other monthly functions)
if y is 6 then only full weeks (Sun - Sat) in the month are considered

The Return Type z is one of the following:

0 if the result is the beginning of the month as a (julian) date value
1 if the result is the beginning of the month as an offset (in days from the current date)
2 if the result is the end of the month as a (julian) date value
3 if the result is the end of the month as an offset (in days from the current date)
4 if the result is the length of the month in days

NOTE: Julian dates are expressed in days since 1/1/4713 B.C.

The resultant date may be used in further calculations:

using addition or subtraction with **any numeric value** will add a number of days to a (julian) date value; for example: "M_DATE(0,2,0) - 7" = the date one week prior to the start of the month.
using subtraction with **two (julian) date values** will return the difference in days as a numeric value; for example: "M_DATE(0,2,0) - M_DATE(-1,2,0)" = the number of days between the start of the current month and the previous month.

Examples:

M_DATE(0,2,0) = the date of the start of the current month, using a "Wednesday" rule
M_DATE(0,1,4) = the length the current month, using a "Saturday" rule

14.7.10 MOY(x)

MOY(x)

Month **O**f the **Y**ear, offset x months

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Value: The numeric value (1 to 12) of the month of the year x months from the current month. January returns 1, February returns 2, etc. The value x is usually 0.

Example:

MOY(0) = current month

14.7.11 WDOM(x)

WDOM(x)

Week**D**ay **O**f the first day of the **M**onth, offset x months

Value: The numeric value (1 to 7) of the weekday of the first day of the month x months from the current month. Sunday returns 1, Monday returns 2, etc.

Examples:

WDOM(0) = weekday of the current month
WDOM(-1) = weekday of the previous month

14.7.12 WOM(x)

WOM(x)

Week **O**f the **M**onth, offset x days

Value: The numeric value (1 to 5) of the week of the month, for the date x days from the current date.

Example:

WOM(0) = current week of the month

14.7.13 YR(x)

YR(x)

the **Y**ea**R**, 1970-2037, offset x years

Value: The numeric value (1970 to 2037) of the year x years from the current year. The value x is usually 0.

Example:

YR(0) = current year

14.8 Hourly Data Functions

Topics in this section include:

- H_AVG([l:p],x,y); Hourly AVeraGe, offset x days, hour y

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- H_CALC([l:p],x,y,z); Houlry CALCulations, value x, offset y days, type z
- H_COMB([l:p],[l:p],x,y); COMBined Hourly, offset x days, type y
- H_COUNT([l:p],x,y); Hourly COUNT, offset x days, hour y
- H_FUNC([l:p],x,y,z); Hourly FUNCtion, offset x days, value y, type z
- H_GMEAN([l:p],x,y); Hourly Geometric MEAN, offset x days, hour y
- H_INTER([l:p],x,y); Hourly INTERpolate from adjacent data, offset x days, hour y
- H_MAX([l:p],x,y,z); Hourly MAXimum, offset x days, hour y, option z
- H_MED([l:p],x,y); Hourly MEDian, offset x days, hour y
- H_METER([l:p],x,y,z); Hourly METER value, offset x days, max meter reading y, multiplier z
- H_MIN([l:p],x,y,z); Hourly MINimum, offset x days, hour y, option z
- H_PRTPWR([l:p],[l:p],x,y); Hourly PoWeR of PaRTicle counts, particle diameter X for first L:P, particle diameter Y for second L:P
- H_STD([l:p],x,y); Hourly STandard Deviation, offset x days, hour y
- H_SUM([l:p],x,y); Hourly SUM, offset x days, hour y
- H_VAL([l:p],x,y); Hourly VALue, offset x days, minutes y

NOTE: Valid times range from 00:01 through 24:00.

14.8.1 H_AVG([l:p],x,y)

H_AVG([l:p],x,y)

Hourly **AV**era**G**e for location and parameter, offset x days, hour y

Value: The average of hourly data values of a specific location and parameter for the date x days from the current date. If y is 0, the values for the entire day are used. If y is from 1 to 24, a single hour is used (i.e. y=3 for values from 02:01 through 03:00).

NOTE: The function may also use the values for an entire day beginning at a specific hour y, by adding the additional parameter H_AVG([l:p],x,y,1) (i.e. y=3 for values from 03:01 the current day through 03:00 the next day).

NOTE: The function may also offset the period to begin on an even hour y, by adding the additional parameter H_AVG([l:p],x,y,2) (i.e. y=3 for values from 02:00 through 02:59, the third hourly period of the day).

Examples:

H_AVG([Effluent:50050],0,0) = average for the day
H_AVG([Effluent:50050],0,15) = average for 14:01 through 15:00
H_AVG([Effluent:50050],-7,0) = average 7 days ago

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14.8.2 H_CALC([l:p],x,y,z)

H_CALC([l:p],x,y,z)

Hourly **CALC**ulation of values x, offset y days, type z, corresponding to an interval or Control Location:Parameter

Value: The hourly values calculated from hourly data, at times based either on a time interval, or at the times corresponding to each data value of the Control Location:Parameter. The function uses the hourly data for the date y days from the current date. It stores the result at the location:parameter where the formula is attached. The function then returns the Hourly Calculation as configured for the location:parameter where the formula is attached. The function considers only valid data, and will return BLANK if there is no valid data. The function uses the following type z to determine the calculation method:

if z is 0 then the hourly results are at the times corresponding to each data value of the Control Location:Parameter *(calculates only at necessary times)*
if z is 1 then the hourly results are at 60 minute intervals *(fastest calculation)*
if z is 2 then the hourly results are at 30 minute intervals *(fast calculation)*
if z is 3 then the hourly results are at 15 minute intervals *(...)*
if z is 4 then the hourly results are at 10 minute intervals *(slow calculation)*
if z is 5 then the hourly results are at 5 minute intervals *(slow calculation)*
if z is 6 then all hourly results are calculated *(slowest calculation)*

A specific whole hour may be specified:
where h is the number of whole hours past midnight, add the additional parameter H_CALC([l:p],x,y,z,h)

The value x may use most functions which do not specify multiple days, weeks, months, or years.

LP(l,p) [l:p]
Boolean (TRUE/FALSE) Functions
Constants
Date Functions (except DATE())
DDE Functions
Mathematical Functions
Miscellaneous Functions (except ACCRUE(), ASSIGN(), ONCE(), SYNC())
Trigonometry Functions

WARNING: The function will calculate and save hourly values in the Location:Parameter where the formula is attached.

NOTE: If the control location:parameter is NOT the location:parameter where the formula is attached, uncalculated data will be deleted.

NOTE: Uncalculated data values will not be deleted if the location:parameter where the formula is attached is also the Control Location:Parameter, or if a specific whole hour is specified.

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NOTE: If data values from the location:parameter where the formula is attached are to be used in the value x, either it must be the Control Location:Parameter, or a specific whole hour must be specified.

NOTE: If a specific hour is specified, the hourly result will always be saved, even if the control Location:Parameter data value is BLANK.

NOTE: Any functions for the value x which allow an offset must use an offset of 0 or BLANK.

Examples:

H_CALC([Eff1:50050],[Eff2:50050]/2,0,0) half the flow from eff2, whenever a corresponding eff1 flow exists
H_CALC([Flow1:50050],[OverFlow:50050],0,2) = OverFlow values every 30 minutes

14.8.3 H_COMB([l:p],[l:p],x,y)

H_COMB([l:p],[l:p],x,y)

Hourly **COMB**ination of two locations and parameters, type y, offset x days

Value: The hourly values calculated from the hourly data at two specific locations and parameters. The function uses the hourly data for the date x days from the current date. It stores the result at the Location:Parameter where the formula is attached, at the time corresponding to each data value. The function then returns the Hourly Calculation as configured for the Location:Parameter where the formula is attached. The function considers only valid data, and will return BLANK if there is no valid data. The function uses the following type z to determine the calculation method:

if y is 0 then the hourly result is the first data values + the second
if y is 1 then the hourly result is the first data value - the second
if y is 2 then the hourly result is the first data value * the second
if y is 3 then the hourly result is the first data value / the second
if y is 4 then the hourly result is the maximum of the data values
if y is 5 then the hourly result is the minimum of the data values
if y is 6 then the hourly result is the average of the data values

WARNING: The function will calculate and save hourly values in the Location:Parameter where the formula is attached.

Examples:

H_COMB([Eff1:50050],[Eff2:50050],0,0) hourly sum of two effluents
H_COMB([Effluent:50050],[OverFlow:50050],0,1) = the difference of hourly data

14.8.4 H_COUNT([l:p],x,y)

H_COUNT([l:p],x,y)

Hourly **COUNT** for location and parameter, offset x days, hour y

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Value: The count of hourly data values of a specific location and parameter for the date x days from the current date. If y is 0, the values for the entire day are used. If y is from 1 to 24, a single hour is used (i.e. y=3 for values from 02:01 through 03:00). The function counts only valid data--it ignores Alpha Codes, Less Than, Greater Than, or Non-Detect values (if Facility options are set to blank).

> ***NOTE:*** The function may also use the values for an entire day beginning at a specific hour y, by adding the additional parameter H_COUNT([l:p],x,y,1) (i.e. y=3 for values from 03:01 the current day through 03:00 the next day).

> ***NOTE:*** The function may also offset the period to begin on an even hour y, by adding the additional parameter H_COUNT([l:p],x,y,2) (i.e. y=3 for values from 02:00 through 02:59, the third hourly period of the day).

Examples:

H_COUNT([Effluent:50050],0,0) = count for the day
H_COUNT([Effluent:50050],0,15) = count for 14:01 through 15:00
H_COUNT([Effluent:50050],-7,0) = count 7 days ago

14.8.5 H_FUNC([l:p],x,y,z)

H_FUNC([l:p],x,y,z)

Hourly **FUNC**tion for location and parameter, value y, type z, offset x days

Value: The hourly values calculated from the hourly data at a specific location and parameter. The function uses the hourly data for the date x days from the current date, and the value y. It stores the result at the Location:Parameter where the formula is attached, at the time corresponding to each data value. The function then returns the Hourly Calculation as configured for the Location:Parameter where the formula is attached. The function considers only valid data, and will return BLANK if there is no valid data. The function uses the following type z to determine the calculation method:

if z is 0 then the hourly result is the data value + y
if z is 1 then the hourly result is the data value - y
if z is 2 then the hourly result is the data value * y
if z is 3 then the hourly result is the data value / y
if z is 4 then the hourly result is the maximum of the data value or y
if z is 5 then the hourly result is the minimum of the data value or y
if z is 6 then the hourly result is the average of the data value and y
if z is 7 then the hourly result is BLANK if the data value exceeds the upper limit y
if z is 8 then the hourly result is BLANK if the data value exceeds the lower limit y
if z is 9 then the hourly result is y

A specific whole hour may be specified::
where h is the number of whole hours past midnight, add the additional parameter H_FUNC([l:p],x,y,z,h)

> ***WARNING:*** The function will calculate and save hourly values in the Location:Parameter where the formula is attached.

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> ***NOTE:*** If type z is 9 and a specific hour is specified, the hourly result will always be returned, even if the data value is BLANK.

Examples:

H_FUNC([Effluent:50050],0,10,2) multiply all hourly data by 10
H_FUNC([Effluent:50050],0,1000,4) = the max of hourly data or 1000

14.8.6 H_GMEAN([l:p],x,y)

H_GMEAN([l:p],x,y)

Hourly **G**eometric **MEAN** for location and parameter, offset x days, hour y

Value: The geometric mean of hourly data values of a specific location and parameter for the date x days from the current date. If y is 0, the values for the entire day are used. If y is from 1 to 24, a single hour is used (i.e. y=3 for values from 02:01 through 03:00).

> ***NOTE:*** The function may also use the values for an entire day beginning at a specific hour y, by adding the additional parameter H_GMEAN([l:p],x,y,1) (i.e. y=3 for values from 03:01 the current day through 03:00 the next day).

> ***NOTE:*** The function may also offset the period to begin on an even hour y, by adding the additional parameter H_GMEAN([l:p],x,y,2) (i.e. y=3 for values from 02:00 through 02:59, the third hourly period of the day).

Examples:

H_GMEAN([Effluent:50050],0,0) = geometric mean for the day
H_GMEAN([Effluent:50050],0,15) = geometric mean for 14:01 through 15:00
H_GMEAN([Effluent:50050],-7,0) = geometric mean 7 days ago

14.8.7 H_INTER([l:p],x,y)

H_INTER([l:p],x,y)

Hourly **INTER**polation of adjacent data for location and parameter, offset x days, hour y

Value: The interpolated hourly data value for a specific location and parameter for the date x days from the current date. The hour y is from 1 to 24 (i.e. y=3 for the value at 03:00). If a value exists for the the hour, it is returned. Otherwise the function considers the last data (the last data not later than the hour) and the next data (the next data not prior to the hour), and returns an interpolated (linear) value. If there are no valid last or next values, the function returns BLANK.

Examples:

H_INTER([Effluent:50050],0,15) = interpolated value for 15:00
H_INTER([Effluent:50050],-7,3) = interpolated value for 03:00, 7 days ago

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14.8.8 H_MAX([l:p],x,y,z)

H_MAX([l:p],x,y,z)

Hourly **MAX**imum for location and parameter, offset x days, hour y, option z

Value: The maximum of hourly data values of a specific location and parameter for the date x days from the current date.

Parameters:

- **[l:p]** - Define a Location:Parameter for which the function will evaluate the hourly maximum
- **x** - The x parameter allows a daily offset to be passed to the function. Use a positive or negative numeric value to calculate values x days from the current date.
- **y** - The y parameter allows numeric values, in the range 0-24 to be passed to the function. Use 0-24 to define the hour of the day to be evaluated. Use 0 to evaluate the entire day, use 1-24 to evaluate the specific single hour of the day (i.e. y=3 for values from 02:01 through 03:00).
- **z** - The optional parameter z, can be used to define special handling options for the calculation and return of values. The optional parameter z can be either 0, 1, 2 or the preceding options (0, 1 or 2) plus 256. Parameter options:
  - **0** - If z is set to 0, the function will return the value for the day x days from the current date only.
  - **1** - If z is set to 1, the function will use the values for an entire 24 hour period beginning at a specific hour y. (i.e. y=3, z=1 for values from 03:01 the current day through 03:00 the next day)
  - **2** - If z is set to 2, the function will offset the period to begin on an even hour y. (i.e. y=3, z=2 for values from 02:00 through 02:59, the third hourly period of the day)
  - **+256** - While z is set to 0, 1 or 2, add 256 to z to return the time of the maximum value for the day x days from the current date. (i.e. y=0, z=256 for the corresponding time of the maximum value for the day)

Examples:

H_MAX([Effluent:50050],0,0,0) = maximum for the day
H_MAX([Effluent:50050],0,15,0) = maximum for 14:01 through 15:00
H_MAX([Effluent:50050],-1,15,1) = maximum value for period beginning 14:01 yesterday and ending 24 hours later at 14:00 the next day (today)
H_MAX([Effluent:50050],-7,0,256) = corresponding time value for the maximum 7 days ago

14.8.9 H_MED([l:p],x,y)

H_MED([l:p],x,y)

Hourly **MED**ian for location and parameter, offset x days, hour y

Value: The median of hourly data values of a specific location and parameter for the date x days from the current date. In the distribution of data values, the middle value is returned. Where there are an even number of values, the average (arithmetic mean) of

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the two middle values is returned. If y is 0, the values for the entire day are used. If y is from 1 to 24, a single hour is used (i.e. y=3 for values from 02:01 through 03:00).

> ***NOTE:*** The function may also use the values for an entire day beginning at a specific hour y, by adding the additional parameter H_MED([l:p],x,y,1) (i.e. y=3 for values from 03:01 the current day through 03:00 the next day).

> ***NOTE:*** The function may also offset the period to begin on an even hour y, by adding the additional parameter H_MED([l:p],x,y,2) (i.e. y=3 for values from 02:00 through 02:59, the third hourly period of the day).

Examples:

H_MED([Effluent:50050],0,0) = median for the day
H_MED([Effluent:50050],0,15) = median for 14:01 through 15:00
H_MED([Effluent:50050],-7,0) = median 7 days ago

14.8.10 H_METER([l:p],x,y,z)

H_METER([l:p],x,y,z)

Hourly **METER** for location and parameter, maximum meter reading y, multiplier z, offset x days

Value: The sum of hourly values calculated from the positive change in hourly meter readings at a specific location and parameter. The function uses the hourly meter data for the date x days from the current date, the last data prior to each hourly reading for that date, the maximum possible whole number meter reading, and a multiplier. It stores the change in meter reading, multiplied by the multiplier value, at the Location:Parameter where the formula is attached, at the time corresponding to each meter data value. The function considers only valid data, and will return BLANK if there is no valid meter data for the current or past dates.

> ***WARNING:*** The function will calculate and save hourly values in the Location:Parameter where the formula is attached.

> ***NOTE:*** The function may also be used to return the sum without recording hourly values, by adding the additional parameter H_METER([l:p],x,y,z,1)

> ***NOTE:*** The function may also be used to calculate and save hourly values ***only*** where none already exist, by adding the additional parameter H_METER([l:p],x,y,z,2) (Note that changing a meter reading will therefore ***not*** recalculate the result unless the result is first deleted.)

> ***NOTE:*** The function may also be used for meters that count down, by specifying a negative value for the maximum meter reading y.

Examples:

H_METER([Effluent:Meter],0,99999,.001) change in meter reading, divided by 1000

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H_METER([Effluent:Meter],0,999,1) = change in meter reading (no multiplier)

14.8.11 H_MIN([l:p],x,y,z)

H_MIN([l:p],x,y,z)

Hourly **MIN**imum for location and parameter, offset x days, hour y, option z

Value: The minimum of hourly data values of a specific location and parameter for the date x days from the current date.

Parameters:

- **[l:p]** - Define a Location:Parameter for which the function will evaluate the hourly minimum
- **x** - The x parameter allows a daily offset to be passed to the function. Use a positive or negative numeric value to calculate values x days from the current date.
- **y** - The y parameter allows numeric values, in the range 0-24 to be passed to the function. Use 0-24 to define the hour of the day to be evaluated. Use 0 to evaluate the entire day, use 1-24 to evaluate the specific single hour of the day (i.e. y=3 for values from 02:01 through 03:00).
- **z** - The optional parameter z, can be used to define special handling options for the calculation and return of values. The optional parameter z can be either 0, 1, 2 or the preceding options (0, 1 or 2) plus 256. Parameter options:
  - **0** - If z is set to 0, the function will return the value for the day x days from the current date only.
  - **1** - If z is set to 1, the function will use the values for an entire 24 hour period beginning at a specific hour y. (i.e. y=3, z=1 for values from 03:01 the current day through 03:00 the next day)
  - **2** - If z is set to 2, the function will offset the period to begin on an even hour y. (i.e. y=3, z=2 for values from 02:00 through 02:59, the third hourly period of the day)
  - **+256** - While z is set to 0, 1 or 2, add 256 to z to return the time of the minimum value for the day x days from the current date. (i.e. y=0, z=256 for the corresponding time of the minimum value for the day)

Examples:

H_MIN([Effluent:50050],0,0,0) = minimum for the day
H_MIN([Effluent:50050],0,15,0) = minimum for 14:01 through 15:00
H_MIN([Effluent:50050],-1,15,1) = minimum value for period beginning 14:01 yesterday and ending 24 hours later at 14:00 the next day (today)
H_MIN([Effluent:50050],-7,0,256) = corresponding time value for the minimum 7 days ago

14.8.12 H_PRTPWR([l:p],[l:p],x,y)

H_PRTPWR([l:p],[l:p],x,y)

Hourly **P**o**W**e**R** of **P**a**RT**icle counts, particle diameter X for first L:P, particle diameter Y for second L:P

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Value: The hourly values calculated from the hourly data at two specific locations and parameters. The function uses the hourly data for the current date. It stores the result at the Location:Parameter where the formula is attached, at the time corresponding to each data value. The function then returns the Hourly Calculation as configured for the Location:Parameter where the formula is attached. The function considers only valid data, existing at the same time for both parameters, and will return BLANK if there is no valid data.

The two L:Ps are two concentrations (usually expressed as a number per ml, or #/ml) of particles larger than a given diameter (usually expressed as microns, or µm, or um). The variable x is the given particle diameter for the first L:P, variable y is for the second. The resultant hourly values are an exponent (or "power") for a "power law distribution" comparing the data values. If the particles are naturally distributed (in a "log normal distribution"), the exponents should theoretically be similar. The function is best used to observe changes which might indicate particles not uniformly distributed.

> ***WARNING:*** The function will calculate and save hourly values in the Location:Parameter where the formula is attached.

Example:

H_PRTPWR([Eff:Part Cnt >2],[Eff:Part Cnt >10],2,10) hourly power values for two Particle Count parameters

14.8.13 H_STD([l:p],x,y)

H_STD([l:p],x,y)

Hourly **ST**andard **D**eviation for location and parameter, offset x days, hour y

Value: The standard deviation of hourly data values of a specific location and parameter for the date x days from the current date. If y is 0, the values for the entire day are used. If y is from 1 to 24, a single hour is used (i.e. y=3 for values from 02:01 through 03:00).

> ***NOTE:*** The function may also use the values for an entire day beginning at a specific hour y, by adding the additional parameter H_STD([l:p],x,y,1) (i.e. y=3 for values from 03:01 the current day through 03:00 the next day).

> ***NOTE:*** The function may also offset the period to begin on an even hour y, by adding the additional parameter H_STD([l:p],x,y,2) (i.e. y=3 for values from 02:00 through 02:59, the third hourly period of the day).

Examples:

H_STD([Effluent:50050],0,0) = standard deviation for the day
H_STD([Effluent:50050],0,15) = standard deviation for 14:01 through 15:00
H_STD([Effluent:50050],-7,0) = standard deviation 7 days ago

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14.8.14 H_SUM([l:p],x,y)

H_SUM([l:p],x,y)

Hourly **SUM** for location and parameter, offset x days, hour y

Value: The sum of hourly data values of a specific location and parameter for the date x days from the current date. If y is 0, the values for the entire day are used. If y is from 1 to 24, a single hour is used (i.e. y=3 for values from 02:01 through 03:00).

> ***NOTE:*** The function may also use the values for an entire day beginning at a specific hour y, by adding the additional parameter H_SUM([l:p],x,y,1) (i.e. y=3 for values from 03:01 the current day through 03:00 the next day).

> ***NOTE:*** The function may also offset the period to begin on an even hour y, by adding the additional parameter H_SUM([l:p],x,y,2) (i.e. y=3 for values from 02:00 through 02:59, the third hourly period of the day).

Examples:

H_SUM([Effluent:50050],0,0) = sum for the day
H_SUM([Effluent:50050],0,15) = sum for 14:01 through 15:00
H_SUM([Effluent:50050],-7,0) = sum 7 days ago

14.8.15 H_VAL([l:p],x,y)

H_VAL([l:p],x,y)

Hourly **VAL**ue for location and parameter, offset x days and y minutes

Value: The data value of a specific location and parameter for the time x days from the current date and y minutes after midnight.

> ***NOTE:*** If y is blank or 0, the daily value is returned.

The function can also return the number of hourly values for the day, or additional information about a particular hourly value can be returned:

if y is 0, add 256 to x in order to return the count of the hourly values
where y is the number of the hourly value (1 is the first, 2 is the second, etc.)
add 256 to x in order to return the offset (in minutes) of the hourly value
add 512 to x in order to return the value of the hourly value

Examples:

H_VAL([Effluent:50050],-1,480) = value yesterday at 8:00am
H_VAL([Effluent:50050],-7,720) = value at noon one week ago

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14.9 Mathematical Functions

Topics included in this section:

- ABS(x); ABSolute value of x
- ADD(x,y);x+y; ADD x and y
- AVG(x1,x2, ... ,xn); AVeraGe of all non-blank values
- COUNT(x1,x2, ... ,xn); COUNT of all non-blank values
- DEFAULT(x,y); value y, or DEFAULT x if y is blank
- DIST(x); standard normal DISTribution of value x
- DIV(x,y); x/y; DIVide x by y
- EXP(x); EXPonential of x, e^x
- FACT(x); FACTorial of value x; 1*2*3*...*x
- FIRST(x1,x2, ... ,xn); FIRST non-blank value
- FRAC(x); FRACtional part of value x
- IDIST(x); Inverse of standard normal DISTribution
- INT(x); INTeger value of x
- INTER(a,c,fa,fc,b); INTERpolated value fb
- INV(x); INVersion of x, 1/x
- LIMIT(x,y,z); LIMIT make value x >=y, <=z
- LN(x); Natural Log of x
- LOG(x); LOG base 10 of x
- LOG_REM(x,y); LOGarithm of REMoval, x in, y out
- MAX(x1,x2, ... ,xn); MAXimum of all values
- MIN(x1,x2, ... ,xn); MINimum of all values
- MOD(x,y); x%y; MODulus or remainder of x/y
- MUL(x,y); x*y; MULtiply x and y
- NONBLANK(x); NONBLANK value of x
- NONZERO(x); NON-ZERO value x, or blank if x is 0
- PCT_REM(x,y); PerCenT REMoval, x in, y out
- PREC(x,y); value x to y significant digits PRECision
- PWR(x,y); x^y; x to the PoWeR of y
- RAND(x); RANDom value less than x
- ROUND(x,y); value x ROUNDed to y decimal places
- ROUNDE(x,y); value x Even-biased ROUNDed to y places
- SQRT(x); SQuare RooT of x
- SUB(x,y); x-y; SUBtract y from x
- SUM(x1,x2, ... ,xn); SUM of all non-blank values
- TRUNC(x,y); TRUNCate value x to y decimal places
- VERIFY(x,y,z); VERIFY value x >=y, <=z, else blank

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14.9.1 ABS(x)

ABS(x)

ABSolute value of x ("absolute value")

Value: The positive value of x. If x is BLANK, the function returns BLANK.

Examples:

ABS(-3.14) = 3.14
ABS(3.14) = 3.14

14.9.2 ADD(x,y); x+y

ADD(x,y); x+y

ADD x and y ("addition")

Value: The sum of x and y. If either x or y is BLANK, the function returns BLANK.

Examples:

ADD(3,2) = 5
3.14+2.14 = 5.28

14.9.3 AVG(x1,x2,...,xn)

AVG(x1,x2, ... ,xn)

AVera**G**e of all non-BLANK values from x1 through xn

Value: The average of values x1 through xn. Any number of values may be specified. If any value is BLANK, the value is ignored. The value BLANK is returned if all values are BLANK.

Examples:

AVG(3,2) = 2.5
AVG(1.2,BLANK,3.2,4.0) = 2.8

14.9.4 COUNT(x1,x2,...xn)

COUNT(x1,x2, ... ,xn)

COUNT of all non-BLANK values from x1 through xn

Value: The count of values x1 through xn. Any number of values may be specified. If any value is BLANK, the value is ignored. The value BLANK is returned if all values are BLANK.

Examples:

COUNT(3,2) = 2
COUNT(1.2,BLANK,3.2,4.0) = 3

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14.9.5 DEFAULT(x,y)

DEFAULT(x,y)

Value y, or **DEFAULT** value x if y is blank

Value: The value y is returned unless it is BLANK, where the default value x is returned instead.

Examples:

DEFAULT(50,[Influent:00021]) = 50 degrees F if there is no value recorded
DEFAULT(0,[Influent:50050]) = same result as NONBLANK([Influent:50050])

14.9.6 DIST(x)

DIST(x)

standard normal **DIST**ribution of value x

Value: The area under the standard normal distribution curve for the value x.

Examples:

DIST(1.96) = .975
DIST(0) = .5

14.9.7 DIV(x,y); x/y

DIV(x,y); x/y

DIVide x by y ("division")

Value: The quotient of x and y (x divided by y). If either x or y is BLANK, the function returns BLANK.

Examples:

DIV(7.5,30) = .25
3.14/2 = 1.57

14.9.8 EXP(x)

EXP(x)

EXPonential of x ("exponential")

Value: Exponential of x, e^x. The constant e (2.718) raised to the power of x. If x is BLANK, the function returns BLANK.

Examples:

EXP(0) = 1
EXP(3.14) = 23.104

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14.9.9 FACT(x)

FACT(x)

FACTorial of value x; 1*2*3*...*x

Value: The factorial of the integer value of x, 1*2*3*...*x. If x is BLANK or less than 0, the function returns BLANK.

Examples:

FACT(4) = 24 (1*2*3*4)
FACT(3.5) = 6 (1*2*3)

14.9.10 FIRST(x1,x2,...,xn)

FIRST(x1,x2, ... ,xn)

FIRST non-BLANK value from x1 through xn

Value: The first of values x1 through xn. Any number of values may be specified. If any value is BLANK, the value is ignored. The value BLANK is returned if all values are BLANK.

NOTE: If the last value is a constant "default" value, the function will always return a value.

NOTE: Once the first value has been found, remaining values are never processed.

Examples:

FIRST(x,y,z) = x, if it is not blank; or else y, if it is not blank; or else z, if it is not blank
FIRST([Influent:50050],[Effluent:50050],3.2) = the first flow value found, or the default 3.2

14.9.11 FRAC(x)

FRAC(x)

FRACtional part of the value x

Value: The fractional part of the value x is returned. If x is BLANK, the function returns BLANK.

Examples:

FRAC(123.456) = .456
FRAC(-3.14) = -.14

14.9.12 IDIST(x)

IDIST(x)

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Inverse of the standard normal **DIST**ribution for value x

Value: The value of the standard normal distribution curve for the area x. If x is not between 0 and 1, the function returns BLANK.

Examples:

IDIST(.975) = 1.96
IDIST(.5) = 0

14.9.13 INT(x)

INT(x)

INTeger value of x

Value: The largest integer not greater than x. If x is BLANK, the function returns BLANK.

Examples:

INT(3.14) = 3
INT(-3.14) = -4

14.9.14 INTER(a,c,fa,fc,b)

INTER(a,c,fa,fc,b)

INTERpolated value fb

Value: The interpolated result for b, where fa and fc are the known function results for values a and b.

Examples:

INTER(2,5,40,100,3) = interpolated result for 3 (60)

14.9.15 INV(x)

INV(x)

INVersion of x, 1/x

Value: The value equal to 1/x. If x is BLANK or x is equal to 0, the function returns BLANK.

Examples:

INV(.25) = 4
INV(1000) = .001

14.9.16 LIMIT(x,y,z)

LIMIT(x,y,z)

LIMIT the value x so that it is not less than y, and not greater than z

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Value: The value x. If x is less than the limit y, it is increased to equal y. If x is greater than the limit z, it is decreased to equal z. If the limit y or z is BLANK, it is not used.

Examples:

LIMIT(3.14, 0, 10) = 3.14 (the value is already within the limits)
LIMIT(3.14, 10, 20) = 10
LIMIT(240, 100, BLANK) = 240 (no upper limit)

14.9.17 LN(x)

LN(x)

Natural **L**ogarithm (base e) of x

Value: The natural logarithm (base e) of x. The power of the constant e (2.718) which will equal the value x. If x is negative or x is 0 or BLANK, the function returns BLANK.

Examples:

LN(1) = 0
LN(3.14) = 1.144

14.9.18 LOG(x)

LOG(x)

LOGarithm (base 10) of x

Value: The logarithm (base 10) of x. The power of 10 which will equal the value x. If x is negative or x is 0 or BLANK, the function returns BLANK.

Examples:

LOG(100) = 2
LOG(3.14) = .497

14.9.19 LOG_REM(x,y)

LOG_REM(x,y)

LOGarithm of **REM**oval, x in, y out

Value: The logarithm of the removal or reduction from the value x to the value y. If either x or y is BLANK, the function returns BLANK.

If a removal percentage is:

90%, the Log Removal is equal to 1
99%, the Log Removal is equal to 2
99.9%, the Log Removal is equal to 3
99.99%, the Log Removal is equal to 4
etc.

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Examples:

LOG_REM([Inf:BOD 5],[Eff:BOD 5]) = the logarithm of the removal of BOD
LOG_REM(127,0.4) = 2.5

14.9.20 MAX(x1,x2,...,xn)

MAX(x1,x2, ... ,xn)

MAXimum of all values from x1 through xn

Value: The maximum of values x1 through xn. Any number of values may be specified. If any value is BLANK, the value is ignored. The value BLANK is returned if all values are BLANK.

Examples:

MAX(3.14,2.14) = 3.14
MAX(-5,BLANK,2.14) = 2.14

14.9.21 MIN(x1,x2,...,xn)

MIN(x1,x2, ... ,xn)

MINimum of all values from x1 through xn

Value: The minimum of values x1 through xn. Any number of values may be specified. If any value is BLANK, the value is ignored. The value BLANK is returned if all values are BLANK.

Examples:

MIN(3.14,2.14) = 2.14
MIN(5,BLANK,2.14) = 2.14

14.9.22 MOD(x,y); x%y

MOD(x,y); x%y

MODulus or remainder of x / y

Value: The remainder of x / y such that x = i * y + remainder, where i is an integer and the remainder is less than y.

Examples:

MOD(17,5) = 2
153%10 = 3

14.9.23 MUL(x,y); x*y

MUL(x,y); x*y

MULtiply x and y ("multiply")

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Value: The product of x and y. If either x or y is BLANK, the function returns BLANK.

Examples:

MUL(3,2) = 6
3.14*2 = 6.28

14.9.24 NONBLANK(x)

NONBLANK(x)

NONBLANK returns the value x, or returns 0 if x is BLANK

Value: The value returned is guaranteed to be a valid, non-BLANK value. The value 0 is returned if x is BLANK.

Examples:

[Influent:50050] + NONBLANK([Inf2:50050]) = ... returns value even if "Inf2 flow" does not exist
NONBLANK(1.2/0) = 0, returns 0 even though division by 0 is undefined

14.9.25 NONZERO(x)

NONZERO(x)

NONZERO returns the value x, or returns BLANK if x is 0

Value: The value returned is a non-zero value. The value BLANK is returned if x is 0.

Examples:

NONZERO([Inf2:00310]) = ... returns BLANK if 0 was entered
NONZERO(0/3.14) = BLANK

14.9.26 PCT_REM(x,y)

PCT_REM(x,y)

Per**C**en**T** **REM**oval, x in, y out

Value: The percentage of the removal or reduction from the value x to the value y. If either x or y is BLANK, the function returns BLANK.

Examples:

PCT_REM([Inf:BOD 5],[Eff:BOD 5]) = the percent removal of BOD
PCT_REM(127,0.4) = 99.685 %

14.9.27 PREC(x,y)

PREC(x,y)

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Value x to y significant digits **PREC**ision

Value: The value of x rounded to y significant digits of precision. The value of y may range from 0 to 15. If y is equal to 0, 7 digits are used.

> ***NOTE:*** Although calculations can use up to 15 significant digits (double precision), a maximum of 15 significant digits (float precision) are returned or stored.

Examples:

PREC(123.45,4) = 123.5
PREC(123.45,1) = 100

14.9.28 PWR(x,y); x^y

PWR(x,y); x^y

x to the **P**o**W**e**R** of y

Value: The value of x raised to the y power. If either x or y is BLANK, the function returns BLANK. If both x and y are zero, the function returns BLANK. If x is negative and y is not an integer, the function returns BLANK.

Examples:

PWR(2,3) = 8
3.14^2 = 9.8596

14.9.29 RAND(x)

RAND(x)

RANDom value less than x

Value: A random value between (or equal to) 0 and the value of x. If x is BLANK, the function returns BLANK.

Examples:

RAND(1) = .52678
RAND(10) = 9.45988

14.9.30 ROUND(x,y)

ROUND(x,y)

Value x **ROUND**ed to y decimal places

Value: The value of x rounded to y decimal places. Positive y values signify places to the right of the decimal point; negative y values signify places to the left of the decimal point. If x or y is BLANK, the function returns BLANK. Values whose discarded portion is exactly

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between values (i.e. the digit 5) will round up to the next value.

Examples:

ROUND(123.456,2) = 123.46
ROUND(123.456,-1) = 120

14.9.31 ROUNDE(x,y)

ROUNDE(x,y)

Value x **E**ven-biased **ROUND**ed to y decimal places

Value: The value of x even-biased rounded to y decimal places. Positive y values signify places to the right of the decimal point; negative y values signify places to the left of the decimal point. If x or y is BLANK, the function returns BLANK. Values whose discarded portion is exactly between values (i.e. the digit 5) will round to the nearest even value.

Examples:

ROUNDE(123.45,1) = 123.4
ROUNDE(123.35,1) = 123.4
ROUNDE(123.45,-1) = 120

14.9.32 SQRT(x)

SQRT(x)

SQuare **R**oo**T** of x

Value: The square root of x. If x is negative or x is BLANK, the function returns BLANK.

Examples:

SQRT(9.8596) = 3.14
SQRT(100) = 10

14.9.33 SUB(x,y); x-y

SUB(x,y); x-y

SUBtract y from x

Value: The difference of x and y (y subtracted from x). If either x or y is BLANK, the function returns BLANK.

Examples:

SUB(3,2) = 1
3.14-2 = 1.14

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14.9.34 SUM(x1,x2,...,xn)

SUM(x1,x2, ... ,xn)

SUM of all non-BLANK values from x1 through xn

Value: The sum of values x1 through xn. Any number of values may be specified. If any value is BLANK, the value is ignored. The value BLANK is returned if all values are BLANK.

Examples:

SUM(3,2) = 5
SUM(1.2,BLANK,3.2,4.0) = 8.4

14.9.35 TRUNC(x,y)

TRUNC(x,y)

Value x **TRUNC**ated to y decimal places

Value: The value of x truncated to y decimal places. Positive y values signify places to the right of the decimal point; negative y values signify places to the left of the decimal point. If x or y is BLANK, the function returns BLANK.

Examples:

sTRUNC(123.456,-1) = 120

14.9.36 VERIFY(x,y,z)

VERIFY(x,y,z)

VERIFY that the value x is not less than y, and not greater than z

Value: The value x. If x is less than the limit y, or if x is greater than the limit z, the function returns BLANK. If the limit y or z is BLANK, it is not used.

Examples:

VERIFY(3.14, 0, 10) = 3.14 (the value is within the limits)
VERIFY(12.6, 0, 10) = BLANK
VERIFY(12.6, 0, BLANK) = 12.6 (no upper limit)

14.10 Miscellaneous Functions

Topics in this section include:

- ACCRUE([l:p],x); ACCRUE all values, offset x months
- ACODE([l:p],x); numeric Alpha CODE, offset x days
- ALPHA(ab); numeric ALPHA code representation for "ab"

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- APPLY(x,y); apply function 2 (y) to data in function 1 (x)
- ASSIGN([l:p],x,y); ASSIGN value y, type x, to location:parameter
- BIN(x); BINary value of x, expressed as an AlphaCode
- BLANK(x); BLANK; data BLANK, no data exists
- CT(x,y,z,w); disinfection CT (Concentration * Time) for temp, pH, Cl, LI
- CTI(x,y,z,w); interpolated disinfection CT (Concentration * Time) for temp, pH, Cl, LI
- CTR(x,y,z,w); Regression method disinfection CT (Concentration * Time) for temp, pH, Cl, LI
- CVT(a:b,x); ConVerT value x from "abc" units to "def" units
- CYL(x,y); CYLinder volume ratio, height x, diameter y
- FAC(abc,x); value x from another FACility abc
- FORMULA(abc); value from another FORMULA
- HEX(x); HEXadecimal value of x, expressed as an AlphaCode
- HLIME(x,y,z,w,v); Hydrated LIME required in mg/l
- INCLUDE(fn,lp,x,y,z,m); INCLUDE location:parameter with calculated formula
- LI(x,y,z,w,v,n1,n2); Log Inactivation
- LOOK(x,y1,y2, ... ,yn); LOOK up the xth value
- NOTE(abc,x) = Note text abc is associated with the return the value x
- ONCE(x,y); value y ONCE per month, on x'th day
- ONCEW(x,y); value y ONCE per Week, on x'th day
- OPTION(x,y,z,w); value x using OPTIONs for less than (y), greater than (z), or non-detect (w)
- PRE_LMT(x,y); PREtreatment LiMiT, limit type x
- QLIME(x,y,z,w,v); QuickLIME required in mg/l
- RANGE(x1,y2,y3,...yn); find RANGE of data
- SETF(x,formula); SET an internal reference Formula
- SETVAR(x,y); SET VARx variable to value y
- SODA(x); SODA required in mg/l
- SYNC(abc); SYNCronize location with facility abc
- TYPE(x,y); TYPE of data x, set type y
- VAL(abc); VALue (and data type) of abc
- WEIR(x,y,z); WEIR rectangular, gal/min for head x inches, width y ft, type z

14.10.1 ACCRUE([l:p],x)

ACCRUE([l:p],x)

ACCRUE all values for location and parameter, offset x months

Value: The sum of all values prior to and including the month x months from the current month. All valid data is considered.

Additional summary information can be returned:

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where n is the type of summary:
add 256*1 to x in order to return the average of all values
add 256*2 to x in order to return the max of all values
add 256*3 to x in order to return the min of all values
add 256*4 to x in order to return the count of all values

Examples:

ACCRUE([Raw:50050],0) = the sum of all flow values through the current month
ACCRUE([Raw:50050],-1) = the sum through the previous month

14.10.2 ACODE([l:p],x)

ACODE([l:p],x)

Numeric **A**lpha **CODE** representation of the value, offset x days

Value: The value equal to the Alpha Code for a specific location and parameter for the date x days from the current date. This represents the internal storage format for Alpha Codes, useful for comparison or in the ASSIGN() function. If there is no valid Alpha Code for the day, the function returns BLANK.

Examples:

ACODE([Inflow:50050],-1) = Alpha Code representation for the previous day
IF(ACODE([Inflow:50050],0)=ALPHA(AF),2.5,BLANK) = if the value is equal to "AF", then return 2.5

14.10.3 ALPHA(ab)

ALPHA(ab)

Numeric **ALPHA** code representation for "ab"

Value: The value representing the internal storage format for Alpha Codes, useful for comparison or in the ASSIGN() function.

Examples:

ALPHA(ABCDE) = -2738179
ALPHA(AH) = -217
IF(ACODE([Inflow:50050],0)=ALPHA(AF),2.5,BLANK) = if the value is equal to "AF", then return 2.5

14.10.4 APPLY(x,y)

APPLY(x,y)

APPLY function 2 (**y**) to the data used in function 1 (**x**), before returning the result.

Function 1 (x) can be most formulas which use a "range" of data for their source, i.e. most fo the D_, H_, M_, V_, etc. functions, SUM(), AVG(), COUNT(), MAX(), MIN(), etc.

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Function 2 (y) can be any function, and replaces option parameter ".." with each data value.

An optional 3rd parameter where if the parameter is "1", function 2 (y) is applied as the source for data, instead of after the data is obtained.

Examples:

APPLY(SUM(1,2,3),MUL(..,..)) = 1*1 + 2*2 + 3*3, i.e. = 14
APPLY(M_COUNT([l:p],0,0),VERIFY(..,50,100)) = the count of monthly values >= 50 and <= 100
APPLY(SUM(1,2,3),MUL(..,..),1) = 1 * 2 * 3, i.e. = 6

14.10.5 ASSIGN([l:p],x,y)

ASSIGN([l:p],x,y)

ASSIGN value x, type y, to location:parameter, and return x

Value: The value x is written to the given location:parameter as data type y, and also returned.

The type y determines the type of data:

if y is 0 then the value is Data
if y is 1 then the value is BLANK
if y is 2 then the value is a Less Than value (<)
if y is 3 then the value is an Alpha Code
if y is 4 then the value is a Greater Than value (>)
if y is 5 then the value is a Non-Detect value (~)
if y is 6 then the value is a Time value
if y is 7 then the value is a Date value

An Alpha Code should be in its internal representation as returned by the ALPHA() function.

The function can also write data values with the current system date and/or time. Add 8 to y in order to write data to the current system date; add 16 to y in order to write data to the current system time (hourly data entries).

WARNING: The function will calculate and save a value in the given location:parameter, NOT where the formula is attached.

NOTE: The ASSIGN() function must be the first function in a formula unless the return value is to be used.

Examples:

ASSIGN([Influent:00310],.02,2) = assigns <.002 to the l:p, but does not return a value (see Note above)
ASSIGN([Influent:00310],ALPHA(AA),3) = writes "AA" to the l:p

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.5 * ASSIGN([Primary:00310],[Influent:00310],0) = writes the Influent value to Primary, and half the value to the l:p where the formula is attached (since ASSIGN() is NOT the first function in the formula; see Note above)

14.10.6 BIN(x)

BIN(x)

The **BIN**ary value x expressed as an AlphaCode

Value: The value returned is the value of x, expressed as an AlphaCode. (The maximum value is BIN(511) or "B111111111")

> ***NOTE:*** Conversely, a value may be entered into a formula in binary format by preceeding the digits with the characters "0b": for example "0b1111" equals the value 15 (The maximum value is "0b11111111111111111111111111111111" or 4294967295)

Example:

BIN(15) = AlphaCode "B1111"
BIN(8) = AlphaCode "B1000"
0b1111 = the value 15

14.10.7 BLANK(x)

BLANK(x); BLANK

BLANK returns BLANK

Value: The value BLANK is returned. The value x is calculated, but the value is ignored. BLANK is defined as the absence of any valid data.

> ***NOTE:*** Most functions assume BLANK for unentered values. For example "IF([l:p],100,)" assumes "IF([l:p],100,BLANK)".

Examples:

BLANK = no data value
BLANK(SHOW(MONTH LENGTH IS:,LOM(0))) = Shows the month length, but does not return a value

14.10.8 CT(x,y,z,w)

CT(x,y,z,w,n1,n2)

Disinfection **C**oncentration and contact **T**ime required for a particular temp, pH, Cl, LI

Value: The value returned is the "CT", the product of the disinfection concentration ("C" in mg/l) and the time ("T" in minutes) required to treat water for disinfection, where:

x is the lowest water temperature, in degrees centigrade
y is the highest pH

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z is the lowest disinfectant (Chlorine) concentration, in mg/l
w is the Log Inactivation, (e.g. 0.5 for conventional, 1.0 for slow sand)

NOTE: The results are returned from a table with 5 degree (0.5 to 25), 0.5 pH (6 to 9 pH), 0.2 mg/l disinfectant (0.4 to3), and 0.5 log inactivation (0.5 to 3) steps. Values between these steps are not interpolated.

The following optional parameters n1, n2 may be specified for other results:

if n1 is 0 then the result is for Giardia Lamblia, Free Chlorine
if n1 is 1 then the result is for Giardia Lamblia, Chlorine Dioxide
if n1 is 2 then the result is for Giardia Lamblia, Ozone
if n1 is 3 then the result is for Giardia Lamblia, Chloramine
if n1 is 8 then the result is for Virus, Free Chlorine
if n1 is 9 then the result is for Virus, Chlorine Dioxide
if n1 is 10 then the result is for Virus, Ozone
if n1 is 11 then the result is for Virus, Chloramine

if n2 is 0 then the result is from a CT table
if n2 is 1 then the result is interpolated from a CT table (see: CTI())
if n2 is 2 then the result is from a regression formula (see: CTR())

NOTE: Not all combinations of optional values are supported.

Examples:

CT(20, 8.2, 1.90, .5) = required CT in mg/l * minutes
CT([Tap:00010],[Tap:00400],[Tap:50064], .5) = required CT in mg/l * minutes

14.10.9 CTI(x,y,z,w)

CTI(x,y,z,w)

Interpolated Disinfection **C**oncentration and contact **T**ime required for a particular temp, pH, Cl, LI

Value: The value returned is the interpolated product of the disinfection concentration ("C" in mg/l) and the time required ("T" in minutes) to treat water for disinfection, where:

x is the lowest water temperature, in degrees centigrade
y is the highest pH
z is the lowest disinfectant (Chlorine) concentration, in mg/l
w is the Log Inactivation, (e.g. 0.5 for conventional, 1.0 for slow sand)

NOTE: The results are interpolated from a table with 5 degree (0.5 to 25), 0.5 pH (6 to 9 pH), 0.2 mg/l disinfectant (0.4 to3), and 0.5 log inactivation (0.5 to 3) steps.

Examples:

CT(20, 8.2, 1.90, .5) = required CT in mg/l * minutes
CT([Tap:00010],[Tap:00400],[Tap:50064], .5) = required CT in mg/l * minutes

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14.10.1 CTR(x,y,z,w)

CTR(x,y,z,w)

Regression method for Disinfection **C**oncentration and contact **T**ime required for a particular temp, pH, Cl, LI

Value: The value returned uses the regression method for calculating the product of the disinfection concentration ("C" in mg/l) and the time required ("T" in minutes) to treat water for disinfection, where:

x is the lowest water temperature, in degrees centigrade
y is the highest pH
z is the lowest disinfectant (Chlorine) concentration, in mg/l
w is the Log Inactivation, (e.g. 0.5 for conventional, 1.0 for slow sand)

NOTE: The formula where x < 12.5 is: (0.353 * w) * (12.006 + exp(2.46 - (0.073 * x) + (0.125 * z) + (0.389 *y)))

The formula where x >= 12.5 is: (0.361 * w) * (-2.261 + exp(2.69 - (0.065 * x) + (0.111 * z) + (0.361 * y)))

Examples:

CTR(20, 8.2, 1.90, .5) = required CT in mg/l * minutes
CTR([Tap:00010],[Tap:00400],[Tap:50064], .5) = required CT in mg/l * minutes

14.10.1 CVT(a:b,x)

CVT(abc:def,x)

Con**V**er**T** value x from "abc" units to "def" units

Value: The value returned is the value of x, as expressed in "abc" units, converted to "def" units, where "abc" and "def" are each one of the following measurement units:

NOTE: The value x may be omitted to return the conversion factor: CVT(abc:def)

length units

MM millimeters
CM centimeters
IN inches
FT feet
YD yards
M meters
KM kilometers
MI miles

area units

CM2 square centimeters
SQIN square inches
SQFT square feet
SQYD square yards
M2 square meters
ACRE acres
HECT hectares
SQMI square miles

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volume units

(volume may convert to mass at a ratio of 8.34 lb/gal)

ML milliliters
CC cubic centimeters
CUIN cubic inches
FLOZ fluid ounces
QT quarts
L liters
GAL gallons
CUFT cubic feet
CUYD cubic yards
KL kiloliters
M3 cubic meters
ACREIN acre inches
KM3 thousand cubic meters
ACREFT acre feet
MGAL million gallons

mass units

(mass may convert to volume at a ratio of 8.34 lb/gal)

NG nanograms
UG micrograms
MG milligrams
G grams
OZ ounces
KG kilograms
LB pounds
TON tons (english)
MTON tons (metric)

concentration units

NGL nanograms per liter
UGL micrograms per liter
PPB parts per billion
LBMGAL pounds per million gallon
KGHECT kilograms per hectare
LBACRE pounds per acre
MGL milligrams per liter
PPM parts per million
MGKG milligrams per kilogram
GRGAL grains per gallon
KGMTON kilograms per metric ton
GL grams per liter
PCT percent (%)
LBCUFT pounds per cubic foot

time units

SEC seconds
HHMM hours, minutes
MIN minutes
HR hours
HH.MM hours, minutes
DAY days
WK weeks
MO months
YR years
LYR leap years

flow rate units

LPD liters per day
GPD gallons per day
CFD cubic feet per day
GPH gallons per hour
M3D cubic meters per day
LPM liters per minute
GPM gallons per minute
CFM cubic feet per minute
LPS liters per second

pressure units

KGM2 kilograms per square meter
PSF pounds per square foot
MMHG millimeters of mercury
FTW feet of water
INHG inches of mercury
PSI pounds per square inch
KGCM2 kilograms per square centimeter
BAR bars

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KM3D thousand cubic meters per day CFS cubic feet per second MGD million gallons per day	ATM atmospheres

temperature units	numeric units
	(any other unit may be converted, such as CVT(G:MILLI,20) for grams to thousandths)
DK degrees Kelvin DC degrees Centigrade DF degrees Fahrenheit	PICO trillionths NANO billionths MICRO millionths MILLI thousandths CENTI hundredths DECI tenths UNIT ones (blank) ones DEKA tens HECTO hundreds KILO thousands MEGA millions GIGA billions TERA trillions

Examples:

CVT(CM:IN,20) = 20 centimeters converted to inches (7.87)
CVT(IN:CM,20) = 20 inches converted to centimeters (50.8)
CVT(IN:CM) = conversion factor of inches to centimeters (2.54)

14.10.12 CYL(x,y)

CYL(x,y)

CYLinder volume ratio, height x, diameter y

Value: The value returned is the ratio of a partially filled cylindrical tank or pipe, where x is the height of the liquid and y is the diameter of the tank.

> ***NOTE:*** Multiply the total volume of the tank by the volume ratio to find the volume of liquid.

Examples:

CYL(2,10) = ratio for a 10 ft diameter cylinder filled 2 ft deep

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14.10.13 FAC(abc,x)

FAC(dbname:abc,x)

Value x from Database named "dbname" and **FAC**ility named "abc"

Value: The data value from another Facility from a database. The Facility specified MUST be set to "Allow Sharing of Facility Data" in its Facility Options. See additional help in the Synexus main application.

> ***NOTE:*** Omitting the database name will assume to use data from the current database.

Examples:

FAC(AllMax Sample Data,[Influent:50050]) = flow data from sample Facility in current database (no database name specified)
FAC(MyDBName:AllMax Sample Data,[Effluent:50050]) = flow data from sample Facility from named database "MyDBName"
FAC(Synexus:East Station,D_VAL([Effluent:50050],-1,0)) = value last month from database "Synexus"

14.10.14 FORMULA(abc)

FORMULA(x)

a **FORMULA** named x

Value: The value returned by another formula named x. Internal formula names (provided by AllMax) begin with the character "~".

Examples:

FORMULA(My Formula) = 12, where MyFormula is 4*3
FORMULA(~Loading) = 3.14

14.10.15 HEX(x)

HEX(x)

The **HEX**adecimal value x expressed as an AlphaCode

Value: The value returned is the value of x, expressed as an AlphaCode. (The maximum value is HEX(4294967295) or "0xffffffff")

> ***NOTE:*** Conversely, a value may be entered into a formula in hexadecimal format by preceeding the digits with the characters "0x": for example "0x7fff" equals the value 32767 (The maximum value is "0xffffffff" or 4294967295)

Example:

HEX(32767) = AlphaCode "H7fff"
HEX(256) = AlphaCode "H100"

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0xffff = the value 32767

14.10.16 HLIME(x,y,z,w,v)

HLIME(x,y,z,w,v)

Hydrated **LIME** required in mg/l

Value: The value returned is the hydrated lime Ca(OH)2 required (in milligrams per liter) to treat water for softening, where:

x is the available carbon dioxide (CO2), in mg/l (e.g. parameter 00405)
y is the bicarbonate hardness as CaCO3 (or alkalinity), in mg/l (e.g. parameter 00425)
z is the magnesium hardness as CaCO3, in mg/l (e.g. parameter 00920)
w is the excess hydroxide alkalinity as CaCO3, in mg/l (e.g. parameter 00420)
v is the percent strength (purity) of the hydrated lime (usually 90 - 92%)

> ***NOTE:*** Unused variables may be left as BLANK.

Examples:

HLIME([Raw:00405],[Raw:00425],[Raw:00920],[Raw:00420],90) = mg/l lime required
HLIME([Raw:00405],[Raw:00425],[Raw:00920], ,90) * 1.15 = 15% excess of lime required

14.10.17 INCLUDE(fn,[l:p],x,y,z)

INCLUDE(fn,[l:p],x,y,z)

INCLUDE location:parameter **[l:p]** in execution of Function **fn**, offset **X** months, using **Y** values and **Z** rule.

Value: The data value from **fn** including data from **[l:p]** offset x months, using y values and z rule.

if y is 0 then included data uses a calendar month for daily data
if y is 1 then included data uses the Z month rule for daily data
if y is 2 then included data uses hourly values from the calendar month

if z is 0 then the result uses a calendar month
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
(the value 5 is unused, for compatibility with other monthly functions)
if z is 6 then only full weeks (Sun - Sat) in the month are considered

Hourly data for a single day can be included for calculation:
where x is the day offset.
INCLUDE(fn,[l:p],x)

Additional months may be included for calculation:

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where m is the number of months to be included starting from the month offset, add the additional parameter **m**.
INCLUDE(fn,[l:p],x,y,z,m)

A daily range of data can be specified for calculation:
use the function as INCLUDE(fn,[l:p],x,y) where:
offset **x** days, for **y** days

Individual values can also be used:
use the function **INCLUDE(fn,x1,x2, ... ,xn)**

The function (fn) used can be most formulas which use a "range" of data for their source, i.e. most of the D_, H_, M_, V_, etc. functions, SUM(), AVG(), COUNT(), MAX(), MIN(), etc.

Examples:

INCLUDE(SUM(1,2),3,4,5) = 15
INCLUDE(M_MAX([l:p],x,y,z,w),100) = max of monthly values or 100
INCLUDE(M_MAX([l:p],x,y,z,w),[l:p2],x,y,z,w) = monthly max of two parameters
INCLUDE(M_MAX([l:p],0,y,z,w),[l:p],-12,y,z,w) = monthly max this and last year

14.10.18 LI(x,y,z,w,v,n1,n2)

LI(x,y,z,w,v,n1,n2)

Log **I**nactivation for a particular temp, pH, Cl, LI, T, n1, n2

Value: The value returned uses calculation based either tables or the regression method for calculating the actual Log Inactivation in treating water for disinfection, where:

x is the lowest water temperature, in degrees centigrade
y is the highest pH
z is the lowest disinfectant (Chlorine) concentration, in mg/l
w is the Log Inactivation required, (e.g. 3.0 for giardia, 4.0 for viruses)
v is the contact Time in seconds

if n1 is 0 then the result is for Giardia Lamblia, Free Chlorine
if n1 is 1 then the result is for Giardia Lamblia, Chlorine Dioxide
if n1 is 2 then the result is for Giardia Lamblia, Ozone
if n1 is 3 then the result is for Giardia Lamblia, Chloramine
if n1 is 8 then the result is for Virus, Free Chlorine
if n1 is 9 then the result is for Virus, Chlorine Dioxide
if n1 is 10 then the result is for Virus, Ozone
if n1 is 11 then the result is for Virus, Chloramine

if n2 is 0 then the result is based on a CT table
if n2 is 1 then the result is based oninterpolation from a CT table (see: CTI())
if n2 is 2 then the result is based on a regression formula (see: CTR())

NOTE: In general, LI(temp,pH,C,LI,T) = li*(C*T)/CT(temp,pH,C,li)

Examples:

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LI(20, 8.2, 1.90, 3.0, 60, 0, 0) = Log Inactivation of Giardia Lamblia using Free Chlorine by table
LI([Tap:00010],[Tap:00400],[Tap:50064], .5, 60, 9, 2) = Log Inactivation using Chlorine Dioxide for Virus by regression

14.10.19 LOOK(x,y1,y2,...,yn)

LOOK(x1,y1,y2, ... ,yn)

LOOK up the xth value from the values y1 through yn

Value: The xth value of values y1 through yn. Any number of values may be specified. The value BLANK is returned if there is no xth value.

> ***NOTE:*** Only the xth value is processed, all other values are never processed.

Examples:

LOOK(3,10,20,30,40,50) = 30
LOOK(DOW(0),0,1,0,1,0,1,0) = TRUE (1) on Mon, Wed, or Friday, otherwise FALSE(0)

14.10.20 NOTE(abc,x)

NOTE(abc,x)

The **NOTE** text abc is associated with the return the value x

Value: The value x is returned. If the function is the final result of a formula, then the Note text abc is also saved as a Data Note. (Data Notes are visible as Operator Notes in the Synexus main application, and as QuickNotes in the DataView application.) If the Note text is an empty string, any Data Note is removed.

> ***Note:*** The function returns the value with a Data Type identifying it as containing an associated Note. Therefore this function is only useful when it is the final result of a formula, such as the primary function in a formula or within an IF() function.

> ***Note:*** The comma and x may be optionally omitted. If so, the function returns the value BLANK.

> ***Note:*** The function may also used with some Reports to return text in place of a value.

Examples:

NOTE(THIS IS PI.,3.14) = 3.14 (with "THIS IS PI." associated)
NOTE(NO DATA TODAY) = BLANK (with "NO DATA TODAY" associated)
NOTE(,3.14) = 3.14 (calculation will remove any associated Data Note)

14.10.21 ONCE(x,y)

ONCE(x,y)

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The value y **ONCE** per month, on the x'th day of the month

Value: The value y is returned Once per month on the x'th day of the month, or on the last day of the month if x is 0. On all other days, or if x is BLANK, the function returns BLANK.

Examples:

ONCE(15,[Raw WW:50050]) = the flow only on the 15th of the month
ONCE(0,[Raw WW:50050]) = the flow only on the last day of the month

14.10.22 ONCEW(x,y)

ONCEW(x,y)

The value y **ONCE** per **W**eek, on the x'th day of the week

Value: The value y is returned once per week on the x'th day (1 to 7) of the week. On all other days, or if x is BLANK, the function returns BLANK.

Examples:

ONCEW(4,[Raw WW:50050]) = the flow only on each Wednesday
ONCEW(7,[Raw WW:50050]) = the flow only on the last day of the week

14.10.23 OPTION(x,y,z,w)

OPTION(x,y,x,w)

Value x calculated using **OPTION**s for Less Than (y), Greater Than (z), or Non-Detect (w) values

Value: The value of x is returned. The value x may be a single data item, or the result based on multiple data items.

The option y, z, or w is one of the following:

BLANK to use the Facility Options for Less Than (y), Greater Than (z), or Non-Detect (w) values
0 to treat Less Than (y), Greater Than (z), or Non-Detect (w) values as BLANK
1 to treat Less Than (y), Greater Than (z), or Non-Detect (w) values as 0
2 to treat Less Than (y), Greater Than (z), or Non-Detect (w) values as half (or twice) the value
3 to treat Less Than (y), Greater Than (z), or Non-Detect (w) values as the value
4 to preserve Less Than (y), Greater Than (z), or Non-Detect (w) values

Examples:

OPTION([Inf Dom:BOD],4,0,0) = preserves a Less Than, but treats others as BLANK
OPTION(M_SUM([Inf Dom:MGD Flow],0,0),0,0,0) = treats all as BLANK
OPTION([Inf Dom:BOD],2,1,BLANK) = treats a Less Than as half, a Non-Detect as 0, and uses the Facility options for a Greater Than

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14.10.24 PRE_LMT([l:p],x)

PRE_LMT([l:p],x,y)

PREtreatment **LiMiT** for sampling point and parameter, limit type y, offset x months

Value: The limit for a specific sampling point and parameter for the current date.

y is the type of limit:

if y is 0 then the result is the TRC multiplier only
if y is 1 then the result is the average limit
if y is 2 then the result is the maximum limit
if y is 3 then the result is the minimum limit
if y is 4 then the result is the surcharge limit
if y is 5 then the result is the surcharge limit rate
if y is 6 then the result is the surcharge base rate
if y is 7 then the result is the surcharge summary option value (0=Average, 1=Maximum, 2=Sum)
if y is 8 then the result is the include facility value

The TRC multiplier for Conventional or Non-Conventional parameters may also be considered by adding 16 to the type y.

Examples:

PRE_LMT([Effluent:50050],0,2) = maximum limit for the current months
PRE_LMT([Effluent:50050],-6,4) = surcharge limit six months ago

14.10.25 QLIME(x,y,z,w,v)

QLIME(x,y,z,w,v)

Quick**LIME** required in mg/l

Value: The value returned is the quicklime CaO required (in milligrams per liter) to treat water for softening, where:

x is the available carbon dioxide (CO2), in mg/l (e.g. parameter 00405)
y is the bicarbonate hardness as CaCO3 (or alkalinity), in mg/l (e.g. parameter 00425)
z is the magnesium hardness as CaCO3, in mg/l (e.g. parameter 00920)
w is the excess hydroxide alkalinity as CaCO3, in mg/l (e.g. parameter 00420)
v is the percent strength (purity) of the quicklime (usually 88 - 95%)

NOTE: Unused variables may be left as BLANK.

Examples:

QLIME([Raw:00405],[Raw:00425],[Raw:00920],[Raw:00420],90) = mg/l lime required
QLIME([Raw:00405],[Raw:00425],[Raw:00920], ,90) * 1.15 = 15% excess of lime required

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14.10.26 RANGE(x1,y1,y2,...,yn)

RANGE(x1,y1,y2, ... ,yn)

find which **RANGE** contains the value x from the range limits y1 through yn

Value: The index (1 through n) of the first range limit (y1 through yn) which contains the value x (x does not exceed the range limit). Any number of range limits may be specified, and they must be in ascending order. If a range limit is BLANK, it is considered to have no limit and will always contain the value x. If the value x is BLANK, it is contained in the first range. The value BLANK is returned if there is no range which contains the value x.

> ***NOTE:*** Only the limits through the range which includes the value are processed, all other limits are never processed.

Examples:

RANGE(27.5,10,20,30,40,50) = 3 (27.5 exceeds 10 and 20, but not 30, the 3rd value)
RANGE(LOM(0),29,30,31) = 1 if the month has 28 or 29 days, 2 if 30, 3 if 31

14.10.27 SETF(x,y)

SETF(x,formula);

SET an internal reference **F**ormula

Value: The function sets an internal reference formula for later use, and the value TRUE (1) is returned. An internal reference formula may be used in place of any data using the LP(~CALC_LP:~~n) syntax. (see also: LP())

Any internal reference formulas set by SETF() remain in place for as long as the application is loaded. Use an empty string (for example SETF(x,)) to clear a formula.

SETF() may be combined with a LP(~CALC_LP:~~n) syntax, for example:
IF(SETF(1,RAND(100)), M_SUM([~CALC_LP:~~1],0), BLANK) will return the sum of 30 random daily values

Examples:

SETF(1,RAND(100)) = sets reference formula 1 to "RAND(100)". And following formulas, such as LP(~CALC_LP:~~1), will now return a random number
SETF(2,) = clears reference formula 2

14.10.28 SETVAR(x)

SETVAR(x,y);

SET VARx variable to value y

Value: The previous value of the variable is returned. The ten available variables are named "VAR0" through "VAR9". By specifying an x value of 0 to 9, each may be set to the value y. The value y may be BLANK. Variables "VAR0" through "VAR9" may be used in any formula to represent the value.

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NOTE: **VARx variables are shared for ALL Facilities and users** of the OP10 application. The values are saved even when the application is exited. The variables only change when given a new value using SETVAR().

Examples:

SETVAR(0,45.1) = the previous value of VAR0. VAR0 will now be 45.1
SETVAR(2,BLANK) = clears the value of VAR2
[RawWW:50050]*VAR4 = the flow multiplied by the (previously set) variable VAR4

14.10.2 SODA(x)

SODA(x)

SODA required in mg/l

Value: The value returned is the soda ash (Na2CO3) required (in milligrams per liter) to treat water for softening, where x is the noncarbonate hardness as CaCO3, in mg/l (e.g. parameter 00902)

Examples:

SODA([Raw:00902]) = mg/l soda required
SODA([Raw:00902]) / .99 = soda of 99% purity required

14.10.3 SYNC(abc)

SYNC(abc);

SYNCronize location with Facility abc

Value: The value TRUE (1) is returned if the function is successful; the value FALSE (0) if not. The function will copy ALL data for the current date at ALL matching parameters of the matching location of the Facility named "abc". Data values which are BLANK at the Facility will be made BLANK. Parameters which do not exist at both Facilities are unaffected.

Warning: This function affects multiple parameters of the location, and will overwrite any existing data.

NOTE: Attach the formula to ANY single parameter of the location that should be syncronized. The Facility "abc" MUST be set to allow access to data in its Facility Options Editor. See additional help in the Operator 10 main application.

Examples:

SYNC(AllMax Wastewater Facility) = all data values of matching parameters of the current location are copied

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14.10.3 TYPE(x,y)

TYPE(x,y)

Value representing the Data **TYPE** of value x, or set the type of x to type y

Value: If y is BLANK, the Data Type of x is returned; if y is not BLANK, the Data Type is set to the Data Type y, and the value x is returned. The value x may be a single data item, or the result based on multiple data items. See Data Type for additional information.

The Data Type is one of the following:

1 (1st bit set, bit 0) if the result is considered a Numeric value
2 (2nd bit set) if the result is considered a BLANK value
4 (3rd bit set) if the result is considered a Less Than value (<)
8 (4th bit set) if the result is considered an Alpha Code value
16 (5th bit set) if the result is considered a Greater Than value (>)
32 (6th bit set) if the result is considered a Non-Detect value (~)
64 (7th bit set) if the result is considered a Time value
128 (8th bit set) if the result is considered a Note value
256 (9th bit set) if the result is considered a Date value

NOTE: The value 8 (Alpha Code) is rarely returned as a result, since Alpha Codes must be converted to numeric values for calculations. Use the function ISALPHA() to test for Alpha Code values.

NOTE: The function cannot set the Data Type to Note. Instead use the NOTE() function to associate a note.

NOTE: Most errors set the Data Type to 0, even though the value may be BLANK.

Examples:

TYPE(1.23,BLANK) = 1 (numeric data)
TYPE([Inf Dom:50050],BLANK) = 4 if the flow value is a Less Than
TYPE(M_SUM([Inf Dom:50050],0,0),BLANK) = 4 if some values are Less Than
TYPE([Inf Dom:50050],4) = flow value, but considered as produced by a Less Than

14.10.3 VAL(abc)

VAL(abc)

The **VAL**ue represented by abc

Value: The value equal to the representation of "abc". If there is no valid representation, the function returns BLANK.

Any entry containing a colon (:) is a Time value.
Any entry containing a slash (/) is a Date value.
Any entry beginning with a number, plus (+), or minus (-) is a Numeric value.
Any entry beginning with a Less Than (<) is a Less Than value.

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Any entry beginning with a Greater Than (>) is a Greater Than value.
Any entry beginning with a Tilde (~) is a Non-Detect value.
Any entry beginning with an Alphabetic character (A, B, ...) is an Alpha Code.

> ***NOTE:*** The function cannot set the Data Type to Note. Instead use the NOTE() function to associate a note.

The Facility Options may be applied to the value:
add the additional parameter VAL(abc,1)

Examples:

VAL(<10) = a Less Than value of 10
VAL(AA) = The Alpha Code "AA"
VAL(2:15) = The Time "2:15" (135 minutes)

14.10.33 WEIR(x,y,z)

WEIR(x,y,z)

WEIR flow, gal/min for head x inches, width y feet, type z

Value: The estimated flow in gal/min for a weir with a head of x inches and a width of y feet (or angle in degrees).

if z is 0 then the result is the flow for a rectangular contracted weir:
1495 * (width - (height * .2)) * height ^ 3/2 (height x in inches, width y in feet)

if z is 1 then the result is the flow for a 90-degree v-shaped weir:
2.25 * height ^ 5/2 (height x in inches, y is ignored)

if z is 2 then the result is the flow for an angled v-shaped weir:
2.25 * tan (y / 2) * height ^ 5/2 (height x in inches, angle y in degrees)

if z is 3 then the result is the flow for a Cipolletti (trapezoidal) weir:
1512 * width * height ^ 3/2 (height x in inches, width y in feet)

if z is 4 then the result is the flow for a rectangular suppressed weir:
1495 * width * height ^ 3/2 (height x in inches, width y in feet)

Examples:

WEIR(4,5,0) = flow through a rectangular weir, 4 inches by 5 ft wide

14.11 Monthly Data Functions

Topics in this section include:

- M_AVG([l:p],x,y,z,w); AVG, offset x months, type, rule, avg
- M_COMP([l:p],x,y); offset x Days, COMPare offset y days
- M_COUNT([l:p],x); COUNT of values, offset x months
- M_COUNTH([l:p],x); COUNT of Hourly values, offset x months

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- M_DATE(x,y,z); Monthly DATE, offset x months, for month type y
- M_GMEAN([l:p],x); Geometric MEAN, offset x months
- M_MAX([l:p],x,y,z,w); MAX, offset x months, type, rule, avg
- M_MED([l:p],x,y,z); Monthly MEDian, offset x months, type y, rule z
- M_MIN([l:p],x,y,z,w); MIN, offset x months, type, rule, avg
- M_NTH([l:p],x,y,z,n); NTH value, offset x months, type y, avg z, n
- M_PCT([l:p],x,y,w,p); PerCenTile, offset x months, type y, avg w, % p
- M_REM([l:p],x,y); Monthly percent REMoval, offset x months, type y
- M_STAT([l:p],[l:p],x,y); Monthly STATistics, offset x months, type y
- M_STDEV([l:p],x); STandard DEViation, offset x months
- M_SUM([l:p],x); SUM of values, offset x months
- M_SUM2([l:p],x,y,z,w); SUM, offset x months, type, rule, avg
- M_SUMH([l:p],x); SUM of Hourly values, offset x months
- M_TOTAL([l:p],x); TOTAL, offset x months, avg * days
- M_TYPE([l:p],x,y); Monthly data TYPE, offset x months, range type y

14.11.1 M_AVG([l:p],x,y,z,w)

M_AVG([l:p],x,y,z,w)

Monthly **AV**era**G**e for location and parameter, offset x months, type y, rule z, average w

Value: The average of data values of a specific location and parameter for the month x months from the current month. The function uses the following parameters to determine the calculation method:

y is the type of average:

if y is 0 then the result is a monthly, or 30-day, average
if y is 1 then the result is a weekly, or 7-day, average
if y is 2 then the result is an hourly average

z is the rule used for a 7-day average: (see also: W_AVG())

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

Daily values may be considered as persistent (calculations use the last data not later than

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the date) by adding 32 to the type y.

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
M_AVG([l:p],x,y,z,w,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_AVG([l:p],[l_flow:p_flow],x,y,z,w)

Examples:

M_AVG([Effluent:50050],0,0,0,0) = current month, monthly average
M_AVG([Effluent:31614],-1,1,0,1) = previous month, 7-day continuous average for fecals

14.11.2 M_COMP([l:p],x,y)

M_COMP([l:p],x,y)

Monthly **COMP**are for location and parameter, offset x months, offset y months

Value: The difference in data values for a specific location and parameter, comparing the date x months from the current date to the date y months from the current date.

Examples:

M_COMP([Effluent:50050],0,-1) = increase since the previous month
M_COMP([Effluent:50050],0,-12) = increase since the previous year

14.11.3 M_COUNT([l:p],x)

M_COUNT([l:p],x)

Monthly **COUNT** for location and parameter, offset x months.

Value: The count of data values of a specific location and parameter for the month x months from the current month. The function counts only valid data--it ignores Alpha Codes, Less Than, Greater Than, or Non-Detect values (if Facility options are set to blank).

The number of months may be specified:
where m is the number of months, add the additional parameter M_COUNT([l:p],x,m)

Examples:

M_COUNT([Effluent:50050],0) = count of present month
M_COUNT([Effluent:50050],-2,3) = count of 3 months of values beginnging 2 months prior

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14.11.4 M_COUNTH([l:p],x)

M_COUNTH([l:p],x)

Monthly **COUNT** for Hourly data values at location and parameter, offset x months

Value: The count of hourly data values of a specific location and parameter for the month x months from the current month. The function counts only valid data--it ignores Alpha Codes, Less Than, Greater Than, or Non-Detect values (if Facility options are set to blank).

The number of months may be specified:
where m is the number of months, add the additional parameter M_COUNTH([l:p],x,m)

Examples:

M_COUNTH([Effluent:50050],0) = count of present month
M_COUNTH([Effluent:50050],-2,3) = count of 3 months of values beginning 2 months prior

14.11.5 M_DATE(x,y,z)

M_DATE(x,y,z)

Monthly **DATE**, offset x months, for month type y, return type z

Value: The numeric date value, offset, or length for the month x months from the current month.

if y is 0 then the result uses a calendar month
if y is 1 then a week falls in the month which contains its Saturday
if y is 2 then a week falls in the month which contains its Wednesday
if y is 3 then the result uses the first of month, for 4 weeks, 28 days
if y is 4 then the first of month 4th week extends to the end of the month
(the value 5 is unused, for compatibility with other monthly functions)
if y is 6 then only full weeks (Sun - Sat) in the month are considered

The Return Type z is one of the following:

0 if the result is the beginning of the month as a (julian) date value
1 if the result is the beginning of the month as an offset (in days from the current date)
2 if the result is the end of the month as a (julian) date value
3 if the result is the end of the month as an offset (in days from the current date)
4 if the result is the length of the month in days

NOTE: Julian dates are expressed in days since 1/1/4713 B.C.

The resultant date may be used in further calculations:

using addition or subtraction with **any numeric value** will add a number of days to a (julian) date value; for example: "M_DATE(0,2,0) - 7" = the date one week prior to the

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start of the month.
using subtraction with **two (julian) date values** will return the difference in days as a numeric value; for example: "M_DATE(0,2,0) - M_DATE(-1,2,0)" = the number of days between the start of the current month and the previous month.

Examples:

M_DATE(0,2,0) = the date of the start of the current month, using a "Wednesday" rule
M_DATE(0,1,4) = the length the current month, using a "Saturday" rule

14.11.6 M_GMEAN([l:p],x)

M_GMEAN([l:p],x)

Monthly **G**eometric **MEAN** for location and parameter, offset x months (equivalent to logarithmic mean)

Value: The geometric mean of data values of a specific location and parameter for the month x months from the current month. Data values less than 0 are ignored. The function is equivalent to a logarithmic mean (A logarithmic mean returns the same value, although it may use a different calculation method). (see also: Geometric Mean in the main Synexus application)

The number of months may be specified:
where m is the number of months, add the additional parameter M_GMEAN([l:p],x,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_GMEAN([l:p],[l_flow:p_flow],x)

Examples:

M_GMEAN([Effluent:50050],0) = geometric mean of present month
M_GMEAN([Effluent:50050],-1) = geometric mean of previous month

14.11.7 M_MAX([l:p],x,y,z,w)

M_MAX([l:p],x,y,z,w)

Monthly **MAX**imum for location and parameter, offset x months, type y, rule z, average w

Value: The maximum of data values of a specific location and parameter for the month x months from the current month. The function uses the following parameters to determine the calculation method:

y is the type of maximum:

if y is 0 then the result is a monthly, or 30-day, maximum
if y is 1 then the result is a weekly, or 7-day, maximum
if y is 2 then the result is an hourly maximum
if y is 3 then the result is a 4-day maximum

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z is the rule used for a 7-day average: (see also: W_MAX())

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The offset and count of maximum values may also be returned using the following syntax:
add 256*num+type to the value y, where:
num = the number of the maximum
type = 4 for the offset
8 for the value
12 for the time, if data is hourly
16 for the count of maximums, if there are multiple equal values

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
M_MAX([l:p],x,y,z,w,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_MAX([l:p],[l_flow:p_flow],x,y,z,w)

Examples:

M_MAX([Effluent:50050],0,0,0,0) = current month, monthly maximum
M_MAX([Effluent:31614],-1,1,0,1) = previous month, 7-day continuous maximum for fecals

14.11.8 M_MED([l:p],x,y,z)

M_MED([l:p],x,y,z)

Monthly **MED**ian for location and parameter, offset x months, type y, average w

Value: The median of data values of a specific location and parameter for the month x months from the current month. In the distribution of data values, the middle value is returned. Where there are an even number of values, the average (arithmetic mean) of the two middle values is returned. The function uses the following parameters to

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determine the calculation method:

y is the type of minimum:

if y is 0 then the result is a median of monthly, or 30-day values
if y is 1 then the result is a median of weekly, or 7-day continuous, or floating, average of values
if y is 2 then the result is a median of hourly values

z is the type of average used:

if z is 0 then the average is the arithmetic mean (average)
if z is 1 then the average is the geometric mean (for fecals)
if z is 2 then the average is the flow-weighted average

Values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter M_MED([l:p],x,y,w,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_MED([l:p],[l_flow:p_flow],x,y,z)

Examples:

M_MED([Effluent:50050],0,0,0) = median, current month
M_MED([Effluent:31614],-1,1,1) = median, previous month, 7-day continuous avg for fecals

14.11.9 M_MIN([l:p],x,y,z,w)

M_MIN([l:p],x,y,z,w)

Monthly **MIN**imum for location and parameter, offset x months, type y, rule z, average w

Value: The minimum of data values of a specific location and parameter for the month x months from the current month. The function uses the following parameters to determine the calculation method:

y is the type of minimum:

if y is 0 then the result is a monthly, or 30-day, minimum
if y is 1 then the result is a weekly, or 7-day, minimum
if y is 2 then the result is an hourly minimum
if y is 3 then the result is a 4-day minimum

z is the rule used for a 7-day average: (see also: W_MIN())

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday

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if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The offset and count of minimum values may also be returned using the following syntax:
add 256*num+type to the value y, where:
num = the number of the minimum
type = 4 for the offset
8 for the value
12 for the time, if data is hourly
16 for the count of minimums, if there are multiple equal values

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
M_MIN([l:p],x,y,z,w,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_MIN([l:p],[l_flow:p_flow],x,y,z,w)

Examples:

M_MIN([Effluent:50050],0,0,0,0) = current month, monthly minimum
M_MIN([Effluent:31614],-1,1,0,1) = previous month, 7-day continuous minimum for fecals

14.11.1 M_NTH([l:p],x,y,z,n)

M_NTH([l:p],x,y,w,n)

Monthly **NTH** value for location and parameter, offset x months, type y, average w, rank n

Value: The nth data value of a specific location and parameter for the month x months from the current month. The values are ordered from minimum to maximum, and the nth highest value is returned. (For instance, if the data values are 6, 2, 5, 8, and 3, the 4th value would be 6.) If -n is used, the values are ordered from maximum to minimum, and the nth lowest value is returned. If n is blank, zero, or greater than the number of data values, the function returns BLANK. The function uses the following parameters to determine the calculation method:

y is the type of minimum:

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if y is 0 then the result is the nth value of monthly, or 30-day values
if y is 1 then the result is the nth value of weekly, or 7-day continuous, or floating, average of values
if y is 2 then the result is the nth value of hourly values

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

Values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
M_MED([l:p],x,y,w,n,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_NTH([l:p],[l_flow:p_flow],x,y,w,n)

Examples:

M_NTH([Effluent:50050],0,0,0,4) = 4th highest value, current month
M_NTH([Effluent:31614],-1,1,1,-4) = 4th lowest value, previous month, 7-day continuous avg for fecals

14.11.1 M_PCT([l:p],x,y,w,p)

M_PCT([l:p],x,y,w,p)

Monthly **P**er**C**en**T**ile for location and parameter, offset x months, type y, average w, percent p

Value: The percentile of data values of a specific location and parameter for the month x months from the current month. In the distribution of data values into 100 groups having equal frequencies: p percent of the values lie at or below the p-th percentile. The function uses the following parameters to determine the calculation method:

y is the type of percentile:

if y is 0 then the result is a percentile of monthly, or 30-day values
if y is 1 then the result is a percentile of weekly, or 7-day continuous, or floating, average of values
if y is 2 then the result is a percentile of hourly values

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

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Values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
M_PCT([l:p],x,y,w,p,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_PCT([l:p],[l_flow:p_flow],x,y,w,p)

Add 256+y to get the **interpolated** percentile, similar to Microsoft 2007 Excel calculations using the PERCENTILE() function.

Examples:

M_PCT([Effluent:50050],0,0,0,70) = 70th percentile, current month, monthly minimum
M_PCT([Effluent:31614],-1,1,1,70) = 70th percentile, previous month, 7-day continuous avg for fecals

14.11.11 M_REM([l:p],x,y)

M_REM([l:p],x,y)

Monthly percent **REM**oval for location and parameter, offset x months

Value: The average Percent Removal of data values of a specific Efficiency Process and parameter for the month x months from the current month. The location must either be an Efficiency Process location or the effluent location for an Efficiency Process.

y is the type of calculation:
if y is 1 then the result is the average of daily percent removals of loadings (mass)
if y is 2 then the result is the percent reduction of the average of daily concentrations
if y is 3 then the result is the average of daily percent reductions of concentrations
if y is 4 then the result is the percent removal of the average of daily loadings (mass)

The number of months may be specified:
where m is the number of months, add the additional parameter M_REM([l:p],x,m)

NOTE: The parameter may be a concentration parameter (00310, etc.) or any internal parameter based on that parameter (~L00310, ~P00310, etc.)--the correct parameter will be found during calculation.

NOTE: If an effluent location is specified, the first Efficiency Process with an effluent location which matches will be used for calculation.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_REM([l:p],[l_flow:p_flow],x,y)

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Additionally, an influent and effluent Location:Parameter may both be specified that would allow the function to return a percent removal without the requirement of an Efficiency Process being present. The following format should be used:

M_REM([l:p],[l:p],x) where the first [l:p] is a parameter at the influent to a plant process and the second [l:p] is the same parameter at the effluent to a plant process. EXAMPLE: M_REM([Influent:BOD 5],[Effluent:BOD 5],0) would return a percent removal calculated using the Influent and Effluent BOD values.

Examples:

M_REM([Effluent:00310],0,1) = average Percent Removal for the current month, as calculated by averaging daily percent removals of loadings
M_REM([Effluent:00310],-1,2) = previous month, based on the average of daily concentrations

14.11.13 M_STAT([l:p],[l:p],x,y)

M_STAT([l:p],[l:p],x,y)

Monthly **STAT**istics values for location(s) and parameter(s), offset x months, type y

Value: The statistics result for data values of specific location(s) and parameter(s) for the month x months from the current month. If two locations and parameters are used, data values where either is BLANK are ignored. If the second location:parameter is not needed, it may be left BLANK.

The type y determines the result, where:

y = 0 n , the **number** (count) of values (either one or two location:parameters may be used)

y = 1 $\sum x$, the **Sum** of the values (one location:parameter)

y = 2 $\sum x^2$, the **Sum** of the values squared (one location:parameter)

y = 3 $V_x = \frac{\sum\left(x - \frac{\sum x}{n}\right)^2}{n-1}$, the **Sample Variance** of the values (one location:parameter)

y = 4 $S_x = \sqrt{V_x}$, the **Sample Standard Deviation** of the values (one location:parameter)

y = 5 $SS_x = \sum\left(x - \frac{\sum x}{n}\right)^2$, the **Sum of the Squares of the Deviations** of the values (one location:parameter)

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y = 6 $CI_x = 1.96\sqrt{\frac{V_x}{n}}$, the **Confidence Interval** (95%) of the values (assumes large n) (one location:parameter)

y = 7 $\sum_{xy}$, the **Sum of the Products** of the first and second location:parameter

y = 8 $C_{xy} = \frac{SS_{xy}}{n}$, the **Covariance** of the values

y = 9 $SS_{xy} = \sum\left(x - \frac{\sum x}{n}\right)\left(y - \frac{\sum y}{n}\right)$, the **Sum of the Products of the Deviations** of the values

y = 10 $b = \frac{SS_{xy}}{SS_x}$, the **Slope** of the sample Linear Regression line

y = 11 $a = \frac{\sum y - b\sum x}{n}$, the **y Intercept** of the sample Linear Regression line

y = 12 $r = \frac{SS_{xy}}{\sqrt{SS_x SS_y}}$, the **Correlation Coefficient** of the values

y = 13 $r2 = r^2$, the **Coefficient of Determination** of the values

y = 14 $V_x = \frac{\sum\left(x - \frac{\sum x}{n}\right)^2}{n}$, the **Population Variance** of the values (one location:parameter)

y = 15 $S_x = \sqrt{V_x}$, the **Population Standard Deviation** of the values (one location:parameter)

The number of months may be specified:
where m is the number of months, add the additional parameter M_STAT([l:p], [l:p],x,y,m)

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Examples:

M_STAT([Inf Dom:50050],BLANK,-1,1) = sum of past month
M_STAT([Inf Dom:50050],[Inf Ind:50050],0,8) = Covariance for the month

14.11.14 M_STDEV([l:p],x)

M_STDEV([l:p],x)

Monthly **ST**andard **DEV**iation for location and parameter, offset x months

Value: The standard deviation of data values of a specific location and parameter for the month x months from the current month. (see also: Standard Deviation in the main Synexus application)

The number of months may be specified:
where m is the number of months, add the additional parameter M_STDEV([l:p],x,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_STDEV([l:p],[l_flow:p_flow],x)

Examples:

M_STDEV([Effluent:50050],0) = standard deviation of present month
M_STDEV([Effluent:50050],-1) = standard deviation of previous month

14.11.15 M_SUM([l:p],x)

M_SUM([l:p],x)

see also: M_SUM2()

Monthly **SUM** for location and parameter, offset x months

Value: The sum of data values of a specific location and parameter for the month x months from the current month.

The number of months may be specified:
where m is the number of months, add the additional parameter M_SUM([l:p],x,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_SUM([l:p],[l_flow:p_flow],x)

Examples:

M_SUM([Effluent:50050],0) = sum of present month
M_SUM([Effluent:50050],-1) = sum of previous month

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14.11.16 M_SUM2([l:p],x,y,z,w)

M_SUM2([l:p],x,y,z,w)

see also: M_SUM()

Monthly **SUM** for location and parameter, offset x months, type y, rule z, average w

Value: The sum of data values of a specific location and parameter for the month x months from the current month. The function uses the following parameters to determine the calculation method:

y is the type of sum:

if y is 0 then the result is a monthly, or 30-day, sum
if y is 1 then the result is a weekly, or 7-day, sum
if y is 2 then the result is an hourly sum
if y is 3 then the result is a 4-day sum

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
M_SUM([l:p],x,y,z,w,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_SUM2([l:p],[l_flow:p_flow],x,y,z,w)

Examples:

M_SUM2([Effluent:50050],0,0,0,0) = current month, monthly sum
M_SUM2([Effluent:31614],-1,1,0,1) = previous month, sum of 7-day continuous averages for fecals

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14.11.17 M_SUMH([l:p],x)

M_SUMH([l:p],x)

Monthly **SUM** for **H**ourly data values at location and parameter, offset x months

Value: The sum of hourly data values of a specific location and parameter for the month x months from the current month.

The number of months may be specified:
where m is the number of months, add the additional parameter M_SUMH([l:p],x,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_SUMH([l:p],[l_flow:p_flow],x)

Examples:

M_SUMH([Effluent:50050],0) = sum of present month
M_SUMH([Effluent:50050],-1) = sum of previous month

14.11.18 M_TOTAL([l:p],x)

M_TOTAL([l:p],x)

Monthly **TOTAL** for location and parameter, offset x months (average * number of days)

Value: The total of data values of a specific location and parameter for the month x months from the current month. The total is defined as the average of values, multiplied by the number of days in the month.

The number of months may be specified:
where m is the number of months, add the additional parameter M_TOTAL([l:p],x,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter M_TOTAL([l:p],[l_flow:p_flow],x)

Examples:

M_TOTAL([Effluent:50050],0) = total of present month
M_TOTAL([Effluent:50050],-1) = total of previous month

14.11.19 M_TYPE([l:p],x,y)

M_TYPE([l:p],x,y)

Monthly data **TYPE**s for location and parameter, offset x months, range type y

Value: The return value is a combination representing the types of data values of a specific location and parameter for the month x months from the current month.

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The value of y determines the range of data:

if y is 0 then the result represents a monthly range
if y is 1 then a week falls in the month which contains its Saturday
if y is 2 then a week falls in the month which contains its Wednesday
if y is 3 then the result uses the first of month, for 4 weeks, 28 days
if y is 4 then only full weeks (Sun - Sat) in the month are considered
if y is 5 then the result represents a monthly range of hourly values

The number of months may be specified:
where m is the number of months, add the additional parameter M_TYPE([l:p],x,y,m)

The return value is a sum of the following types:

add 1 to the return (1st bit set, bit 0) if the range contains Numeric values
add 2 to the return (2nd bit set) if the range contains BLANK values
add 4 to the return (3rd bit set) if the range contains Less Than values (<)
add 8 to the return (4th bit set) if the range contains Alpha Code values
add 16 to the return (5th bit set) if the range contains Greater Than values (>)
add 32 to the return (6th bit set) if the range contains Non-Detect values (~)
add 64 to the return (7th bit set) if the range contains Time values
add 128 to the return (8th bit set) if the range contains Note values
add 256 to the return (9th bit set) if the range contains Date values

For example, a month containing both Numeric and Less Than values returns the value 5 (1 + 4).

NOTE: The return value may be interpreted using the BIT() function

Examples:

M_TYPE([Effluent:50050],0,0) = current month, daily values
M_TYPE([Effluent:31614],-1,5) = previous month, hourly values

14.12 OPC/DDE Functions

Topics in this section include:

- DDE(a|b!c,x); DDE link, replacing char '?' with x
- DDE_P(a|b|c,x,y); DDE Poke value y
- DDE_X(a|b!c,x); DDE eXecute command c
- OPC([a],b,c,x); OPC link for node a, server b, item c, integer x
- OPC_W([a],b,c,x,y); OPC Write for node a, server b, item c, integer x, value y

14.12.1 DDE(a|b!c,x)

DDE(a|b!c,x)

Value from a **DDE** link, Service a, Topic b, Item c, replacing char '?' with value x

Value: The data value returned by a Dynamic Data Exchange (DDE) link with another open

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application. The other application requires specific Service, Topic, and Item strings (see documentation of the other application). The '|' and '!' characters separate the strings, and the '?' character in any string is replaced by the integer value of x (For example, if x is equal to 4 then "R?C1" becomes "R4C1"). If the DDE link does not succeed, the original value of the Location:Parameter will be returned (the data will be unchanged). If the DDE link succeeds but no valid data is returned, the returned value will be BLANK.

Calculations using DDE links are very dependent upon another application, and may therefore be much slower than normal calculations, especially if the link must "time out" because of errors. In most cases, the other application must be running and the appropriate file must be open. Synexus DDE links require the other application to be able to return a single value in the ascii text (CF_TEXT) format. The Service string is usually the name of the application, the Topic string is usually the filename and/or page, and the Item string is usually a reference to the specific data. Use the '?' character and specify the value x when, for example, the link depends on the day of the month (using the DOM() function) to determine a row or column.

NOTE: Additional '?' characters may be replaced by using additional x values, separated by commas.

NOTE: Use this function with care! AllMax cannot offer technical support for other applications, so be sure you understand DDE links before using this function.

NOTE: Several DDE formats for other applications are described in the Synexus DDE Interface Application. (see: DDE Link Server Definition)

Examples:

DDE(EXCEL|[Book1.XLS]Sheet1!R?C1,DOM(0))
Retrieves value from Microsoft Excel, the file "BOOK1.XLS" and sheet "SHEET1", using the row based on the day of the month, and using the first column

DDE(EXCEL|Sheet1!R?C?,MOY(0),DOM(0)+4)
Retrieves value from Microsoft Excel, any open file having sheet "SHEET1", using the row based on the month, and using the column beginning after the fourth column and based on the day of the month

14.12.2 DDE_P(a|b!c,x,y)

DDE_P(a|b!c,x,y)

Poke value y via a **DDE** link, Service a, Topic b, Item c, replacing char '?' with value x

Value: A Dynamic Data Exchange (DDE) link is established with another open application, and the value y is Poked (exported to the other application without its request). The other application requires specific Service, Topic, and Item strings (see documentation of the other application). The '|' and '!' characters separate the strings, and the '?' character in any string is replaced by the integer value of x (For example, if x is equal to 4 then "R?C1" becomes "R4C1"). If the DDE link succeeds, the value TRUE is returned, otherwise FALSE is returned.

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In most cases, the other application must be running and the appropriate file must be open. Operator 10® DDE links require the other application to be able to return a single value in the ascii text (CF_TEXT) format. The Service string is usually the name of the application, the Topic string is usually the filename and/or page, and the Item string is usually a reference to the specific data. Use the '?' character and specify the value x when, for example, the link depends on the day of the month (using the DOM() function) to determine a row or column.

NOTE: Additional '?' characters may be replaced by using additional x values, separated by commas.

NOTE: Use this function with care! AllMax cannot offer technical support for other applications, so be sure you understand DDE links before using this function.

Examples:

DDE_P(EXCEL|[Book1.XLS]Sheet1!R?C1,DOM(0),[Influent:50050])
Pokes value into Microsoft Excel, the file "BOOK1.XLS" and sheet "SHEET1", using the row based on the day of the month, and using the first column

DDE_P(EXCEL|Sheet1!R?C?,MOY(0),DOM(0)+4,[Influent:50050])
Pokes value into Microsoft Excel, any open file having sheet "SHEET1", using the row based on the month, and using the column beginning after the fourth column and based on the day of the month

14.12.3 DDE_X(a|b!c,x)

DDE_X(a|b!c)

DDE E**X**ecute, Service a, Topic b, Comand c, returning value TRUE or FALSE

Value: A Dynamic Data Exchange (DDE) link is established with another open application, and the Command is executed. The other application requires specific Service, Topic, and Command strings (see documentation of the other application). The '|' and '!' characters separate the strings. If the DDE link succeeds, the value TRUE is returned, otherwise FALSE is returned.

In most cases, the other application must be running and the appropriate file must be open. Synexus DDE links require the other application to be able to return a single value in the ascii text (CF_TEXT) format. The Service string is usually the name of the application, the Topic string is usually either the string "SYSTEM" or the filename and/or page, and the Command string is usually a command or macro name.

NOTE: Use this function with care! AllMax cannot offer technical support for other applications, so be sure you understand DDE links before using this function.

14.12.4 OPC([a],b,c,x)

OPC([a],b,c,x)

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Value from an **OPC** link, specifying Node **a** (optional), Server **b**, Item **c**, Integer **x** (optional)

Value: The data value returned by an OLE for Process Control (OPC) link with an OPC Server. The Node is an optional workstation name or IP address where the OPC Server is running. The OPC Server application requires specific Service and Item strings (see documentation of that application). If the OPC link does not succeed, the original value of the Location:Parameter will be returned (the data will be unchanged). If the OPC link succeeds but no valid data is returned, the returned value will be BLANK. The '?' character in any string is replaced by the integer value of x (For example, if x is equal to 4 then "R?C1" becomes "R4C1").

Calculations using OPC links are very dependent upon another application, and may therefore be much slower than normal calculations, especially if the link must "time out" because of errors. In most cases, the Server application should already be running. Synexus OPC links require the Server application to be able to return a numeric value--Less Than, Alpha Code, Greater Than, Non-Detect, and Time values are not supported. Use the '?' character and specify the value x when, for example, the link depends on the day of the month (using the DOM() function) to determine a row or column.

NOTE: Additional '?' characters may be replaced by using additional x values, separated by commas.

NOTE: Use this function with care! AllMax cannot offer technical support for other applications, so be sure you understand OPC links before using this function.

NOTE: Item names are **Case Specific**--"MyTag" is **NOT** the same as "Mytag".

Examples:

OPC(Hexatec.PCData.1,Memory.Load)
Retrieves the current Memory Load percentage value from the Hexatec PC Data Server

OPC(SERVER1,MyServer,Tag_001) or OPC(\\SERVER1,MyServer,Tag_001) or OPC(192.168.0.1,MyServer,Tag_001)
Item from MyServer running on the workstation SERVER1 at IP address 192.168.0.1

14.12.5 OPC_W([a],b,c,x,y)

OPC_W([a],b,c,x,y)

Write value y via an **OPC** link, Node a, Server b, Item c, replacing char '?' with value x

Value: A OLE for Process Control (OPC) link is established with another open application, and the value y is Written (exported to the other application without its request). The other application requires specific Topic, and Item strings (see documentation of the other application). The '|' and '!' characters separate the strings, and the '?' character in any string is replaced by the integer value of x (For example, if x is equal to 4 then "R?C1" becomes "R4C1"). If the DDE link succeeds, the value TRUE is returned, otherwise FALSE is returned.

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In most cases, the other application must be running and the appropriate file must be open. Synexus DDE links require the other application to be able to return a single value in the ascii text (CF_TEXT) format. The Service string is usually the name of the application, the Topic string is usually the filename and/or page, and the Item string is usually a reference to the specific data. Use the '?' character and specify the value x when, for example, the link depends on the day of the month (using the DOM() function) to determine a row or column.

> ***NOTE:*** Additional '?' characters may be replaced by using additional x values, separated by commas.

> ***NOTE:*** Use this function with care! AllMax cannot offer technical support for other applications, so be sure you understand OPC links before using this function.

Examples:

OPC_W(\\SERVER1,MyServer,Tag?,DOM(0),[Influent:50050])
Writes value into MyServer, the tag "Tag", using the row based on the day of the month, and using the first column

14.13 Process Section Data Functions

Topics in this section include:

- ACCUM([l:p],x,y); ACCUMulate, offset x months, y days
- S_AVG([l:p],x); AVG of process sections
- S_SUM([l:p],x); SUM of process sections

14.13.1 ACCUM([l:p],x,y)

ACCUM([l:p],x,y)

Flow **ACCUM**ulation for location and parameter, offset x months and y days

Value: Flow for a specific location for the month x months and y days from the current date. If the location is a process, the flow is based on process accumulation settings. If the location is a process section, the flow is based on section location or flow percentage. The value p is ignored (use ~).

> ***WARNING:*** If the location is a process, the function will also calculate and save loadings for any existing parameters. If a matching process effluent parameter exists, the function will also calculate and save removals and percent removals, and loadings left if it is an efficiency process.

> ***NOTE:*** If the Facility uses Metric calculations, this function will return metric results for all calculations.

Examples:

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ACCUM([Process:~],0,0) = returns process flow, calculates and saves process loadings, removals, percent removals
ACCUM([Section:~],0,0) = returns section flow

14.13.2 S_AVG([l:p],x)

S_AVG([l:p],x)

Section **AV**era**G**e for location and parameter, offset x days

Value: The average of like parameter values of process sections of the same process and the same section type as the specified location, x days from the current date.

Example:

S_AVG([Section:50050],0) = average section flow for all similar process sections

14.13.3 S_SUM([l:p],x)

S_SUM([l:p],x)

Section **SUM** for location and parameter, offset x days

Value: The sum of like parameter values of process sections of the same process and the same section type as the specified location, x days from the current date.

Example:

S_SUM([Section:50050],0) = sum of section flow for all similar process sections

14.14 Quaterly Data Functions

Topics in this section include:

- Q_CSUM([l:p],x); Calendar Quarter SUM of daily values, offset x months
- Q_SUM([l:p],x); Quarterly SUM of daily values, offset x months

14.14.1 Q_CSUM([l:p],x)

Q_CSUM([l:p],x)

Calendar **Q**uarter **SUM** of daily values for location and parameter, offset x months

Value: The sum of data values of a specific location and parameter for the calendar quarter (beginning January, April, July, or October) from the first month of the quarter through the month x months from the current month.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:

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add the additional parameter Q_CSUM([l:p],[l_flow:p_flow],x)

Examples:

Q_CSUM([Effluent:50050],0) = quarterly sum through the present month
Q_CSUM([Effluent:31614],-1) = quarterly sum through the previous month

14.14.2 Q_SUM([l:p],x)

Q_SUM([l:p],x)

Quarterly **SUM** of daily values for location and parameter, offset x months

Value: The sum of data values of a specific location and parameter for a quarter (3 months) beginning x months from the current month.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter Y_SUM([l:p],[l_flow:p_flow],x)

Examples:

Q_SUM([Effluent:50050],0) = current month, quarterly sum
Q_SUM([Effluent:31614],-3) = previous quarter sum

14.15 Trigonometry Functions

Topics included in this section:

- ACOS(x); ArcCOSine of x
- ASIN(x); ArcSINe of x
- ATAN(x); ArcTANgent of x
- COS(x); COSine of x
- CSC(x); CoSeCant of x
- SEC(x); SECant of x
- SIN(x); SINe of x
- TAN(x); TANgent of x

14.15.1 ACOS(x)

ACOS(x)

Arc**COS**ine of x in degrees

Value: The arccosine of x returned in degrees. The value of x must be between -1 and 1. If x is BLANK, the function returns BLANK.

Examples:

ACOS(.707107) = 45

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ACOS(0) = 90

14.15.2 ASIN(x)

ASIN(x)

Arc**SIN**e of x in degrees

Value: The arcsine of x returned in degrees. The value of x must be between -1 and 1. If x is BLANK, the function returns BLANK.

Examples:

ASIN(.707107) = 45
ASIN(1) = 90

14.15.3 ATAN(x)

ATAN(x)

Arc**TAN**gent of x in degrees

Value: The arctangent of x returned in degrees. If x is BLANK, the function returns BLANK.

Examples:

ATAN(.57735) = 30
ATAN(1) = 45

14.15.4 COS(x)

COS(x)

COSine of x degrees

Value: The cosine of x degrees. If x is BLANK, the function returns BLANK.

Examples:

COS(45) = .707107
COS(90) = 0

14.15.5 CSC(x)

CSC(x)

Co**S**e**C**ant of x degrees

Value: The cosecant of x degrees. If x is BLANK, the function returns BLANK.

Examples:

CSC(45) = 1.41421

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CSC(90) = 1

14.15.6 SEC(x)

SEC(x)

SECant of x degrees

Value: The secant of x degrees. If x is BLANK, the function returns BLANK.

Examples:

SEC(45) = 1.41421
SEC(0) = 1

14.15.7 SIN(x)

SIN(x)

SINe of x degrees

Value: The sine of x degrees. If x is BLANK, the function returns BLANK.

Examples:

SIN(45) = .707107
SIN(90) = 1

14.15.8 TAN(x)

TAN(x)

TANgent of x degrees

Value: The tangent of x degrees. If x is BLANK, the function returns BLANK.

Examples:

TAN(45) = .57735
TAN(30) = 0

14.16 Violation Data Functions

Topics in this section include:

- E_SUM([l:p],x,y,z,w,v); Exceedance SUM, offset, type, rule, avg, limit
- V_AVG([l:p],x,y,z,w,v); offset, type, rule, avg, Violation AVG
- V_CNT([l:p],x,y,z,w); offset, type, rule, Violation CouNT values
- V_CNTP([l:p],x,y,z,w); offset, type Period, Violation CouNT values, months

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- V_DLY([l:p],x,y,z,w); DaiLY Violation, offset, type, max, min
- V_DLYM([l:p],x,y,z,w); DaiLY Multiple Violation, offset, type, max, min
- V_MAV([l:p],x,y,z,w,v); offset, type, rule, avg, Violation Min AVerage
- V_MAX([l:p],x,y,z,w,v); offset, type, rule, avg, Violation MAX
- V_MIN([l:p],x,y,z,w,v); offset, type, rule, avg, Violation MIN
- SNC_CJP([l:p],x,y,z,w,v1,v2); offset, type, rule, avg, daily violation, avg violation
- SNC_MAXD([l:p],x,y,z,w,v); offset, type, rule, avg, SNC violation MAX Daily
- SNC_MAXM([l:p],x,y,z,w,v); offset, type, rule, avg, SNC violation MAX Monthly
- SNC_MIND([l:p],x,y,z,w,v); offset, type, rule, avg, SNC violation MIN Daily
- SNC_MINM([l:p],x,y,z,w,v); offset, type, rule, avg, SNC violation MIN Monthly

14.16.1 E_SUM([l:p],x,y,z,w,v)

E_SUM([l:p],x,y,z,w,v)

monthly **E**xceedance **SUM** limit z for location and parameter, offset x months, type y, rule z, average w, limit v

Value: The sum of the portions which exceed the limit v, of data values for a specific location and parameter for the month x months from the current month. The function uses the following parameters to determine the calculation method:

y is the type of sum:

if y is 0 then the result is a monthly, or 30-day, sum
if y is 1 then the result is a weekly, or 7-day, sum
if y is 2 then the result is an hourly sum
if y is 3 then the result is a 4-day sum

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

if z is 16 then the result uses a continuous, or floating, average, but only counts violations based on unique data

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

v is the violation limit

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> ***NOTE:*** A lower limit (instead of an upper limit) may be used by adding 4 to the type y.

> ***NOTE:*** The sum of the entire data values (instead of the portions) may be used by adding 8 to the type y.

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter E_SUM([l:p],[l_flow:p_flow],x,y,z,w,v)

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
E_SUM([l:p],x,y,z,w,v,m)

Examples:

E_SUM([Effluent:50050],0,0,0,0,3.14) = sum of exceedances for current month, exceeding 3.14
E_SUM([Effluent:31614],-1,1,0,0,3.14) = sum of exceedances for previous month, 7-day continuous avg exceeding 3.14

14.16.2 V_AVG([l:p],x,y,z,w,v)

V_AVG([l:p],x,y,z,w,v)

monthly **AVG V**iolation for location and parameter, offset x months, type y, rule z, average w, limit v

> ***NOTE:*** For average violations which are below a limit, see V_MAV().

Value: The average violation of data values (a violation occurs when the average is above the limit) of a specific location and parameter for the month x months from the current month. The function uses the following parameters to determine the calculation method:

y is the type of average:

if y is 0 then the result is a monthly, or 30-day, average
if y is 1 then the result is a weekly, or 7-day, average
if y is 2 then the result is an hourly average

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month

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if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

if z is 16 then the result uses a continuous, or floating, average, but only counts violations based on unique data

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

v is the violation limit

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
V_AVG([l:p],x,y,z,w,v,m)

The function will return the number of violations for the month. Additional information about a particular violation can be returned:

where vnum is the number of the violation (1 is the first, 2 is the second, etc.)
add 256*vnum+4 to y in order to return the offset of the day of the violation
add 256*vnum+8 to y in order to return the value of the violation

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter V_AVG([l:p],[l_flow:p_flow],x,y,z,w,v)

Examples:

V_AVG([Effluent:50050],0,0,0,0,3.14) = number of violations for current month, monthly average exceeding 3.14
V_AVG([Effluent:31614],-1,1,0,1,3.14) = number of violations for previous month, 7-day continuous average for fecals exceeding 3.14
V_AVG([Effluent:31614],-1,(256*2+8)+1,0,1,3.14) = value of the second violation for previous month, 7-day continuous average for fecals exceeding 3.14

14.16.3 V_CNT([l:p],x,y,z,w)

V_CNT([l:p],x,y,z,w)

monthly **C**ou**NT** **V**iolation for location and parameter, offset x months, type y, rule z, limit w

Value: The count violation of data values of a specific location and parameter for the month x months from the current month.

The function uses the following parameters to determine the calculation method:

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y is the type of minimum:

if y is 0 then the result is a monthly, or 30-day, count (violation if count of daily values is less than w)
if y is 1 then the result is a weekly, or 7-day, count (violation if count of daily values is less than w per week)
if y is 2 then the result is an hourly count (violation if count of hourly values is less than w per day)

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

if z is 16 then the result uses a continuous, or floating, average, but only counts violations based on unique data

w is the violation limit

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
V_CNT([l:p],x,y,z,w,m)

The function will return the number of violations for the month. Additional information about a particular violation can be returned:

where vnum is the number of the violation (1 is the first, 2 is the second, etc.)
add 256*vnum+4 to y in order to return the offset of the day of the violation
add 256*vnum+8 to y in order to return the value (count of data values) of the violation

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter V_CNT([l:p],[l_flow:p_flow],x,y,z,w)

Examples:

V_CNT([Effluent:31614],0,1,1,3) = number of violations for current month if count is less than 3 per week
V_CNT([Effluent:31614],0,(256*2+8)+1,1,3) = value of the second violation for previous month
V_CNT([Effluent:31614],(256*3)-3,0,0,4) = number of violations for previous quarter if count is less than 4 per month

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14.16.4 V_CNTP([l:p],x,y,z,w)

V_CNTP([l:p],x,y,z,w)

monthly **P**eriod **C**ou**NT** **V**iolation for location and parameter, offset x months, type y, limit z, months w

Value: The count violation of data values of a specific location and parameter for the month x months from the current month.

The function uses the following parameters to determine the calculation method:

y is the type of period where the limit is applied:

if y is 1 then the result is based on a daily period (violation if count of hourly or daily values is less than z per day)
if y is 2 then the result is based on a weekly period (violation if count of daily values is less than z per week)
if y is 3 then the result is based on a monthly period (violation if count of daily values is less than z per month)
if y is 4 then the result is based on a quarterly period (violation if count of daily values is less than z per quarter)
if y is 5 then the result is based on a semi-annual period (violation if count of daily values is less than z per 6-month)
if y is 6 then the result is based on a yearly period (violation if count of daily values is less than z per year)

z is the violation limit

w is the number of months

The function will return the number of violations for the month. Additional information about a particular violation can be returned:

where vnum is the number of the violation (1 is the first, 2 is the second, etc.)
add 256*vnum+8 to y in order to return the offset of the day of the violation
add 256*vnum+16 to y in order to return the value (count of data values) of the violation

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter V_CNTP([l:p],[l_flow:p_flow],x,y,z,w)

Examples:

V_CNTP([Effluent:31614],0,2,3,1) = number of violations for current month if count is less than 3 per week
V_CNTP([Effluent:31614],0,(256*2+16)+2,3,1) = value of the second violation for previous month
V_CNTP([Effluent:31614],(256*3)-3,3,4,3) = number of violations for previous quarter if count is less than 4 per month

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14.16.5 V_DLY([l:p],x,y,z,w)

V_DLY([l:p],x,y,z,w)

Dai**LY** **V**iolation for location and parameter, offset x days, type y, max limit z, min limit w

Value: The count or duration of violations for hourly data values of a specific location and parameter for the date x days from the current date. Hourly data values that exceed maximum limit z, or minimum limit w, are considered. If the limit z or w is BLANK, it is not used. The type y determines the information returned:

if y is 0 then the result is the count of the number of violations for the day
if y is 1 then the result is the duration (for the entire day) in hours that hourly data values exceed limits x or y. The result will range from 0 to 24 hours. If the previous day's last value exceeds the limits, then the duration starts at the beginning of the day. Durations are accumulated until the violation ends, or the end of the day.

NOTE: The duration is the same as that returned be the V_DLYM function.

NOTE: **Additional information about a particular violation can be returned:**

where vnum is the number of the violation (1 is the first, 2 is the second, etc.), or 0 for the longest violation,
if y is 256*vnum+2 then the result is the time of the start of the violation in hours since midnight
if y is 256*vnum+3 then the result is the duration of the violation in hours (This may be greater than 24 hours)
if y is 256*vnum+4 then the result is the value of the data at the violation

Examples:

V_DLY([Effluent:00058],0,0,BLANK,100) = number of flow readings that fall below 100 g/min
V_DLY([Effluent:00058],0,1,500,BLANK) = hours that flow exceeds 500 g/min for the day
V_DLY([Effluent:50050],0,256*1+2,500,BLANK) = the time in hours of the start of the first violation
V_DLY([Effluent:50050],0,516,500,BLANK) = the value of the second violation (y is equal to 256 * 2 + 4)

14.16.6 V_DLYM([l:p],x,y,z,w)

V_DLYM([l:p],x,y,z,w)

Dai**LY** **M**ultiple **V**iolation for location and parameter, offset x days, type y, max limit z, min limit w

Value: The count or duration of multiple violations for hourly data values of a specific location and parameter for the date x days from the current date. Multiple violations are defined as violations which extend through one or more data readings, and are considered as one violation. Hourly data values that exceed maximum limit z, or minimum limit w, are considered. If the limit z or w is BLANK, it is not used. The type y determines the

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information returned:

if y is 0 then the result is the count of the number of violations for the day
if y is 1 then the result is the duration (for the entire day) in hours that hourly data values exceed limits x or y. The result will range from 0 to 24 hours. If the previous day's last value exceeds the limits, then the duration starts at the beginning of the day. Durations are accumulated until the violation ends, or the end of the day.

NOTE: The duration is the same as that returned be the V_DLY function.

NOTE: **Additional information about a particular violation can be returned:**

where vnum is the number of the violation (1 is the first, 2 is the second, etc.), or 0 for the longest violation,
if y is 256*vnum+2 then the result is the time of the start of the violation in hours since midnight
if y is 256*vnum+3 then the result is the duration of the violation in hours (This may be greater than 24 hours)
if y is 256*vnum+4 then the result is the maximum value of the data recorded during the violation
if y is 256*vnum+5 then the result is the minimum value of the data recorded during the violation
if y is 256*vnum+6 then the result is the average value of the data recorded during the violation

Examples:

V_DLYM([Effluent:00058],0,0,BLANK,100) = number of times flow readings fall below 100 g/min
V_DLYM([Effluent:00058],0,1,500,BLANK) = hours that flow exceeds 500 g/min for the day
V_DLYM([Effluent:50050],0,256*1+2,500,BLANK) = the time in hours of the start of the first multiple violation
V_DLYM([Effluent:50050],0,516,500,BLANK) = the maximum value of the second violation (y is equal to 256 * 2 + 4)

14.16.7 V_MAV([l:p],x,y,z,w,v)

V_MAV([l:p],x,y,z,w,v)

monthly **M**inimum **AV**erage **V**iolation for location and parameter, offset x months, type y, rule z, average w, limit v

NOTE: For average violations which are above a limit, see V_AVG().

Value: The minimum average violation (a violation occurs when the average is below the limit) of data values of a specific location and parameter for the month x months from the current month. The function uses the following parameters to determine the calculation method:

y is the type of average:

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if y is 0 then the result is a monthly, or 30-day, average
if y is 1 then the result is a weekly, or 7-day, average
if y is 2 then the result is an hourly average

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

if z is 16 then the result uses a continuous, or floating, average, but only counts violations based on unique data

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

v is the violation limit

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
V_MAV([l:p],x,y,z,w,v,m)

The function will return the number of violations for the month. Additional information about a particular violation can be returned:

where vnum is the number of the violation (1 is the first, 2 is the second, etc.)
add 256*vnum+4 to y in order to return the offset of the day of the violation
add 256*vnum+8 to y in order to return the value of the violation

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter V_MAV([l:p],[l_flow:p_flow],x,y,z,w,v)

Examples:

V_MAV([Effluent:50050],0,0,0,0,3.14) = number of violations for current month, monthly average exceeding 3.14
V_MAV([Effluent:31614],-1,1,0,1,3.14) = number of violations for previous month, 7-day continuous average for fecals exceeding 3.14
V_MAV([Effluent:31614],-1,(256*2+8)+1,0,1,3.14) = value of the second violation for previous month, 7-day continuous average for fecals exceeding 3.14

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14.16.8 V_MAX([l:p],x,y,z,w,v)

V_MAX([l:p],x,y,z,w,v)

monthly **MAX**imum **V**iolation for location and parameter, offset x months, type y, rule z, average w, limit v

Value: The maximum violation of data values of a specific location and parameter for the month x months from the current month. The function uses the following parameters to determine the calculation method:

y is the type of maximum:

if y is 0 then the result is a monthly, or 30-day, maximum
if y is 1 then the result is a weekly, or 7-day, maximum
if y is 2 then the result is an hourly maximum
if y is 3 then the result is a 4-day maximum

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

if z is 16 then the result uses a continuous, or floating, average, but only counts violations based on unique data

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

v is the violation limit

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
V_MAX([l:p],x,y,z,w,v,m)

The function will return the number of violations for the month. Additional information about a particular violation can be returned:

where vnum is the number of the violation (1 is the first, 2 is the second, etc.)
add 256*vnum+4 to y in order to return the offset of the day of the violation
add 256*vnum+8 to y in order to return the value of the violation

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add 256*vnum+12 to y in order to return the time of the violation for hourly min/max

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter V_MAX([l:p],[l_flow:p_flow],x,y,z,w,v)

Examples:

V_MAX([Effluent:50050],0,0,0,0,3.14) = number of violations for current month, monthly maximum exceeding 3.14
V_MAX([Effluent:31614],-1,1,0,1,3.14) = number of violations for previous month, 7-day continuous maximum for fecals exceeding 3.14
V_MAX([Effluent:31614],-1,(256*2+8)+1,0,1,3.14) = value of the second violation for previous month, 7-day continuous maximum for fecals exceeding 3.14

14.16.9 V_MIN([l:p],x,y,z,w,v)

V_MIN([l:p],x,y,z,w,v)

monthly **MIN**imum **V**iolation for location and parameter, offset x months, type y, rule z, average w, limit v

Value: The minimum violation of data values of a specific location and parameter for the month x months from the current month. The function uses the following parameters to determine the calculation method:

y is the type of minimum:

if y is 0 then the result is a monthly, or 30-day, minimum
if y is 1 then the result is a weekly, or 7-day, minimum
if y is 2 then the result is an hourly minimum
if y is 3 then the result is a 4-day minimum

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

if z is 16 then the result uses a continuous, or floating, average, but only counts violations based on unique data

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

v is the violation limit

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Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
V_MIN([l:p],x,y,z,w,v,m)

The function will return the number of violations for the month. Additional information about a particular violation can be returned:

where vnum is the number of the violation (1 is the first, 2 is the second, etc.)
add 256*vnum+4 to y in order to return the offset of the day of the violation
add 256*vnum+8 to y in order to return the value of the violation

add 256*vnum+12 to y in order to return the time of the violation for hourly min/max

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter V_MIN([l:p],[l_flow:p_flow],x,y,z,w,v)

Examples:

V_MIN([Effluent:50050],0,0,0,0,3.14) = number of violations for current month, monthly minimum exceeding 3.14
V_MIN([Effluent:31614],-1,1,0,1,3.14) = number of violations for previous month, 7-day continuous minimum for fecals exceeding 3.14
V_MIN([Effluent:31614],-1,(256*2+8)+1,0,1,3.14) = value of the second violation for previous month, 7-day continuous minimum for fecals exceeding 3.14

14.16.1 SNC_CJP([l:p],x,y,z,w,v1,v2)

SNC_CJP([l:p],x,y,z,w,v1,v2)

monthly **S**ignificant **N**on **C**ompliance (**SNC**) using **CJP** for location and parameter, offset x months, type y, rule z, average w, daily limit v1, average limit v2

Value: The Significant Non Compliance (SNC) violation using the Compliance Judgement Point (CJP) for data values of a specific location and parameter for 6 months beginning x months from the current month.

The SNC is expressed as a ratio equal to the count of values exceeding the daily limit plus the count of averages exceeding the average limit, divided by the CJP (the count of all values plus the count of all averages). The function uses the following parameters to determine the calculation method:

y is the type of average:

if y is 0 then the result is based on a daily average
if y is 1 then the result is based on weekly, or 7-day, averages

z is the rule used for a 7-day average:

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if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

v1 is the daily violation limit
v2 is the average violation limit

The count of violations and values may be returned instead of the ratio:

add 4 to y in order to return the count of violations
add 8 to y in order to return the count of values

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months is assumed to be 6, but may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
SNC_CJP([l:p],x,y,z,w,v1,v2,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter SNC_CJP([l:p],[l_flow:p_flow],x,y,z,w,v1,v2)

Examples:

SNC_CJP([Effluent:00400],0,0,0,0,8.5,8) = current 6 months SNC, daily maximum exceeding 8.5, monthly avg exceeding 8
SNC_CJP([Effluent:00400],-6,1,3,0,8.5*1.2,8*1.2) = previous 6 months SNC, 7-day 1st of Month, exceeding limits by 20%
SNC_CJP([Effluent:00400],-6,1,3,0,8.5*1.2,8*1.2)>.33 = TRUE if the ratio is greater than 33%

14.16.1 SNC_MAXD([l:p],x,y,z,w,v)

SNC_MAXD([l:p],x,y,z,w,v)

monthly **S**ignificant **N**on **C**ompliance (**SNC**) **MAX**imun **D**aily violation for location and parameter, offset x months, type y, rule z, average w, limit v

Value: The maximum daily Significant Non Compliance (SNC) violation for data values of a specific location and parameter for 6 months beginning x months from the current month.

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The SNC is expressed as a ratio equal to the count of values exceeding the limit divided by the count of all values. The function uses the following parameters to determine the calculation method:

y is the type of average:

if y is 0 then the result is based on a daily maximum
if y is 1 then the result is based on a weekly, or 7-day, maximum
if y is 2 then the result is based on an hourly maximum
if y is 3 then the result is based on a 4-day maximum

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

v is the violation limit

The count of violations and values may be returned instead of the ratio:

add 4 to y in order to return the count of violations
add 8 to y in order to return the count of values

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months is assumed to be 6, but may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
SNC_MAXD([l:p],x,y,z,w,v,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter SNC_MAXD([l:p],[l_flow:p_flow],x,y,z,w,v)

Examples:

SNC_MAXD([Effluent:00400],0,0,0,0,8.5) = current 6 months SNC, monthly maximum exceeding 8.5
SNC_MAXD([Effluent:00400],-6,1,3,0,8.5*1.2) = previous 6 months SNC, 7-day 1st of Month maximum exceeding 8.5 by 20%
SNC_MAXD([Effluent:00400],-6,1,3,0,8.5*1.2)>.33 = TRUE if the ratio is greater than

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33%

14.16.12 SNC_MAXM([l:p],x,y,z,w,v)

SNC_MAXM([l:p],x,y,z,w,v)

monthly **S**ignificant **N**on **C**ompliance (**SNC**) **MAX**imun **M**onthly violation for location and parameter, offset x months, type y, rule z, average w, limit v

Value: The maximum monthly average Significant Non Compliance (SNC) violation for data values of a specific location and parameter for 6 months beginning x months from the current month.

The SNC is expressed as a ratio equal to the count of monthly averages exceeding the limit divided by the count of all months having values. The function uses the following parameters to determine the calculation method:

y is the type of average:

if y is 0 then the result is based on a daily maximum
if y is 1 then the result is based on a weekly, or 7-day, maximum
if y is 2 then the result is based on an hourly maximum
if y is 3 then the result is based on a 4-day maximum

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

v is the violation limit

The count of months having violations and values may be returned instead of the ratio:

add 4 to y in order to return the count of months having violations
add 8 to y in order to return the count of months having values

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months is assumed to be 6, but may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter

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SNC_MAXM([l:p],x,y,z,w,v,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter SNC_MAXM([l:p],[l_flow:p_flow],x,y,z,w,v)

Examples:

SNC_MAXM([Effluent:00400],0,0,0,0,8.5) = current 6 months SNC, monthly average exceeding 8.5
SNC_MAXM([Effluent:00400],-6,1,3,0,8.5*1.2) = previous 6 months SNC, 7-day 1st of Month average exceeding 8.5 by 20%
SNC_MAXM([Effluent:00400],-6,1,3,0,8.5*1.2)>.33 = TRUE if the ratio is greater than 33%

14.16.13 SNC_MIND([l:p],x,y,z,w,v)

SNC_MIND([l:p],x,y,z,w,v)

monthly **S**ignificant **N**on **C**ompliance (**SNC**) **MIN**imun **D**aily violation for location and parameter, offset x months, type y, rule z, average w, limit v

Value: The minimum daily Significant Non Compliance (SNC) violation for data values of a specific location and parameter for 6 months beginning x months from the current month.

The SNC is expressed as a ratio equal to the count of values exceeding the limit divided by the count of all values. The function uses the following parameters to determine the calculation method:

y is the type of average:

if y is 0 then the result is based on a daily minimum
if y is 1 then the result is based on a weekly, or 7-day, minimum
if y is 2 then the result is based on an hourly minimum
if y is 3 then the result is based on a 4-day minimum

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

v is the violation limit

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The count of violations and values may be returned instead of the ratio:

add 4 to y in order to return the count of violations
add 8 to y in order to return the count of values

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months is assumed to be 6, but may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
SNC_MIND([l:p],x,y,z,w,v,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter SNC_MIND([l:p],[l_flow:p_flow],x,y,z,w,v)

Examples:

SNC_MIND([Effluent:00400],0,0,0,0,5.5) = current 6 months SNC, monthly minimum below 5.5
SNC_MIND([Effluent:00400],-6,1,3,0,5.5*.8) = previous 6 months SNC, 7-day 1st of Month minimum pH below 5.5 by 20%
SNC_MIND([Effluent:00400],-6,1,3,0,5.5*.8)>.33 = TRUE if the ratio is greater than 33%

14.16.14 SNC_MINM([l:p],x,y,z,w,v)

SNC_MINM([l:p],x,y,z,w,v)

monthly **S**ignificant **N**on **C**ompliance (**SNC**) **MIN**imun **M**onthly violation for location and parameter, offset x months, type y, rule z, average w, limit v

Value: The minimum monthly average Significant Non Compliance (SNC) violation for data values of a specific location and parameter for 6 months beginning x months from the current month.

The SNC is expressed as a ratio equal to the count of monthly averages exceeding the limit divided by the count of all months having values. The function uses the following parameters to determine the calculation method:

y is the type of average:

if y is 0 then the result is based on a daily minimum
if y is 1 then the result is based on a weekly, or 7-day, minimum
if y is 2 then the result is based on an hourly minimum
if y is 3 then the result is based on a 4-day minimum

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday

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if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

v is the violation limit

The count of months having violations and values may be returned instead of the ratio:

add 4 to y in order to return the count of months having violations
add 8 to y in order to return the count of months having values

Daily values may be considered as persistent (calculations use the last data not later than the date) by adding 32 to the type y.

The number of months is assumed to be 6, but may be specified for monthly, 7-day, and hourly calculations:
where m is the number of months, add the additional parameter
SNC_MINM([l:p],x,y,z,w,v,m)

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter SNC_MINM([l:p],[l_flow:p_flow],x,y,z,w,v)

Examples:

SNC_MINM([Effluent:00400],0,0,0,0,5.5) = current 6 months SNC, monthly average below 5.5
SNC_MINM([Effluent:00400],-6,1,3,0,5.5*.8) = previous 6 months SNC, 7-day 1st of Month average pH below 5.5 by 20%
SNC_MINM([Effluent:00400],-6,1,3,0,5.5*.8)>.33 = TRUE if the ratio is greater than 33%

14.17 Weekly Data Functions

Topics in this section include:

- W_AVG([l:p],x,y,z,w); Weekly AVG, offset x months, week, rule, avg
- W_MAX([l:p],x,y,z,w); Weekly MAX, offset x months, week, rule, avg
- W_MIN([l:p],x,y,z,w); Weekly MIN, offset x months, week, rule, avg

14.17.1 W_AVG([l:p],x,y,z,w)

W_AVG([l:p],x,y,z,w)

AVera**G**e of **W**eekly average (7-day) values for location and parameter, offset x months,

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week y, rule z, average w

Value: The average of weekly averages of data values of a specific location and parameter for the month x months from the current month. The function uses the following parameters to determine the calculation method:

y is the week of average:

if y is 0 then the result is the weekly average for a monthly period (see also: M_AVG())
if y is 1 then the result is the weekly, or 7-day, average for the first week
if y is 2 then the result is for the second week
if y is 3 then the result is for the third week
if y is 4 then the result is for the fourth week
if y is 5 then the result is for the fifth week
etc.

special cases:

if y is 32 then the result is the offset (from the first of the calendar month) of the start day of the monthly period
if y is 33 then the result is the offset of the last day of the monthly period

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter W_AVG([l:p],[l_flow:p_flow],x,y,z,w)

Examples:

W_AVG([Effluent:50050],0,0,0,0) = current month, monthly 7-day average
W_AVG([Effluent:31614],-1,1,6,1) = previous month, first full week average for fecals

14.17.2 W_MAX([l:p],x,y,z,w)

W_MAX([l:p],x,y,z,w)

MAXimum of **W**eekly average (7-day) values for location and parameter, offset x months,

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week y, rule z, average w

Value: The maximum of weekly averages of data values of a specific location and parameter for the month x months from the current month. The function uses the following parameters to determine the calculation method:

y is the week of average:

if y is 0 then the result is the maximum weekly average for a monthly period (see also: M_MAX())
if y is 1 then the result is the weekly, or 7-day, average for the first week
if y is 2 then the result is for the second week
if y is 3 then the result is for the third week
if y is 4 then the result is for the fourth week
if y is 5 then the result is for the fifth week
etc.

special cases:

if y is 32 then the result is the calculated offset based on the "z" calculation type; the numeric offset represents the beginning of the reporting period in which the weekly calculations are to be made.
if y is 33 then the result is the calculated offset based on the "z" calculation type; the numeric offset represents the end of the reporting period in which the weekly calculations are to be made.
if y is 34 then the result is the calculated offset based on the "z" calculation type; the numeric offset represents the beginning of the 7 day period (week) which is calculated as the weekly maximum average using the value returned when using the special case "32" to determine the beginning of the period to be reported.

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter W_MAX([l:p],[l_flow:p_flow],x,y,z,w)

Examples:

W_MAX([Effluent:50050],0,0,0,0) = current month, monthly 7-day maximum

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W_MAX([Effluent:31614],-1,1,6,1) = previous month, first full week average for fecals

14.17.3 W_MIN([l:p],x,y,z,w)

W_MIN([l:p],x,y,z,w)

MINimum of **W**eekly average (7-day) values for location and parameter, offset x months, week y, rule z, average w

Value: The minimum of weekly averages of data values of a specific location and parameter for the month x months from the current month. The function uses the following parameters to determine the calculation method:

y is the week of average:

if y is 0 then the result is the minimum weekly average for a monthly period (see also: M_MIN())
if y is 1 then the result is the weekly, or 7-day, average for the first week
if y is 2 then the result is for the second week
if y is 3 then the result is for the third week
if y is 4 then the result is for the fourth week
if y is 5 then the result is for the fifth week
etc.

special cases:

if y is 32 then the result is the calculated offset based on the "z" calculation type; the numeric offset represents the beginning of the reporting period in which the weekly calculations are to be made.
if y is 33 then the result is the calculated offset based on the "z" calculation type; the numeric offset represents the end of the reporting period in which the weekly calculations are to be made.
if y is 34 then the result is the calculated offset based on the "z" calculation type; the numeric offset represents the beginning of the 7 day period (week) which is calculated as the weekly minimum average using the value returned when using the special case "32" to determine the beginning of the period to be reported.

z is the rule used for a 7-day average:

if z is 0 then the result uses a continuous, or floating, average
if z is 1 then a week falls in the month which contains its Saturday
if z is 2 then a week falls in the month which contains its Wednesday
if z is 3 then the result uses the first of month, for 4 weeks, 28 days
if z is 4 then the first of month 4th week extends to the end of the month
if z is 5 then the first of month is controlled by facility option
if z is 6 then only full weeks (Sun - Sat) in the month are considered

w is the type of average used:

if w is 0 then the average is the arithmetic mean (average)
if w is 1 then the average is the geometric mean (for fecals)
if w is 2 then the average is the flow-weighted average

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When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter W_MIN([l:p],[l_flow:p_flow],x,y,z,w)

Examples:

W_MIN([Effluent:50050],0,0,0,0) = current month, monthly 7-day minimum
W_MIN([Effluent:31614],-1,1,6,1) = previous month, first full week average for fecals

14.18 Yearly Data Functions

Topics in this section include:

- Y_AVG([l:p],x,y,z); Yearly AVG Daily value, offset, months, type
- Y_AVGM([l:p],x,y,z); Yearly AVG, Monthly average, offset, months, type
- Y_CAVG([l:p],x,y); Calendar Year AVG of daily values, offset x months, type
- Y_COUNT([l:p],x,y); Yearly COUNT of daily values, offset x months, for y months
- Y_CSUM([l:p],x); Calendar Year SUM of daily values, offset x months
- Y_MAX([l:p],x,y); Yearly MAX daily value, offset x months, for y months
- Y_MAXM([l:p],x,y,z); Yearly MAX Monthly average, offset, months, type
- Y_MIN([l:p],x,y); Yearly MIN daily value, offset x months, for y months
- Y_MINM([l:p],x,y,z); Yearly MIN Monthly average, offset, months, type
- Y_RES([l:p],x,y1,y2,y3,y4); Yearly RESidual, offset x years, percents y1, y2, y3, y4
- Y_SUM([l:p],x,y); Yearly SUM of daily values, offset x months, for y months
- Y_TOTM([l:p],x,y); Yearly sum of Monthly TOTals, offset x months, for y months

14.18.1 Y_AVG([l:p],x,y,z)

Y_AVG([l:p],x,y,z)

Yearly **AV**era**G**e of daily values for location and parameter, offset x months, for y months, average z

Value: The average of daily data values of a specific location and parameter for y months beginning x months from the current month. If y is 0 or BLANK, the function assumes 1 year. The value z is the type of average used:

if z is 0 then the average is the arithmetic mean (average)
if z is 1 then the average is the geometric mean (for fecals)
if z is 2 then the average is the flow-weighted average

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter Y_AVG([l:p],[l_flow:p_flow],x,y,z)

Examples:

Y_AVG([Effluent:50050],0,0,0) = start current month, yearly average
Y_AVG([Effluent:31614],-6,6,1) = previous 6 month average for fecals

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14.18.2 Y_AVGM([l:p],x,y,z)

Y_AVGM([l:p],x,y,z)

Yearly **AV**era**G**e of **M**onthly averages for location and parameter, offset x months, for y months, average z

Value: The average of monthly averages for a specific location and parameter for y months beginning x months from the current month. If y is 0 or BLANK, the function assumes 1 year. The value z is the type of monthly average used:

if z is 0 then the average is the arithmetic mean (average)
if z is 1 then the average is the geometric mean (for fecals)
if z is 2 then the average is the flow-weighted average

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter Y_AVGM([l:p],[l_flow:p_flow],x,y,z)

Examples:

Y_AVGM([Effluent:50050],0,0,0) = start current month, yearly average
Y_AVGM([Effluent:31614],-6,6,1) = previous 6 month average for fecals

The Average 3-Month Average (of monthly averages) may be specified by adding the additional parameter Y_AVGM([l:p],x,y,z,3)

14.18.3 Y_CAVG([l:p],x,y)

Y_CAVG([l:p],x,y)

Calendar **Y**ear **AV**era**G**e of daily values for location and parameter, offset x months, average y

Value: The average of data values of a specific location and parameter for the calendar year from January through the month x months from the current month. The value y is the type of average used:

if y is 0 then the average is the arithmetic mean (average)
if y is 1 then the average is the geometric mean (for fecals)
if y is 2 then the average is the flow-weighted average

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter Y_CAVG([l:p],[l_flow:p_flow],x,y)

Examples:

Y_CAVG([Effluent:50050],0,0) = yearly average from January through the present month
Y_CAVG([Effluent:31614],-1,1) = yearly geometric mean through the previous month

The start month of the calendar may be specified:
where m is the start month (January is 1), add the additional parameter

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Y_CAVG([l:p],x,m)

14.18.4 Y_COUNT([l:p],x,y,z)

Y_COUNT([l:p],x,y)

Yearly **COUNT** of daily values for location and parameter, offset x months, for y months

Value: The count of data values of a specific location and parameter for y months beginning x months from the current month. If y is 0 or BLANK, the function assumes 1 year. The function counts only valid data--it ignores Alpha Codes, Less Than, Greater Than, or Non-Detect values (if Facility options are set to blank).

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter Y_COUNT([l:p],[l_flow:p_flow],x,y

Examples:

Y_COUNT([Effluent:50050],0,0) = start current month, yearly count
Y_COUNT([Effluent:31614],-6,6) = previous 6 month count

14.18.5 Y_CSUM([l:p],x)

Y_CSUM([l:p],x)

Calendar **Y**ear **SUM** of daily values for location and parameter, offset x months

Value: The sum of data values of a specific location and parameter for the calendar year from January through the month x months from the current month.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter Y_CSUM([l:p],[l_flow:p_flow],x)

Examples:

Y_CSUM([Effluent:50050],0) = yearly sum from January through the present month
Y_CSUM([Effluent:31614],-1) = yearly sum through the previous month

The start month of the calendar may be specified:
where m is the start month (January is 1), add the additional parameter
Y_CSUM([l:p],x,m)

14.18.6 Y_MAX([l:p],x,y)

Y_MAX([l:p],x,y)

Yearly **MAX**imum for location and parameter, offset x months, for y months

Value: The maximum of data values of a specific location and parameter for y months beginning x months from the current month. If y is 0 or BLANK, the function assumes 1

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year.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter Y_MAX([l:p],[l_flow:p_flow],x,y)

Examples:

Y_MAX([Effluent:50050],0,0) = start current month, yearly maximum
Y_MAX([Effluent:31614],-6,6) = previous 6 month maximum

14.18.7 Y_MAXM([l:p],x,y,z)

Y_MAXM([l:p],x,y,z)

Yearly **MAX**imum of **M**onthly averages for location and parameter, offset x months, for y months, average z

Value: The maximum of the monthly averages for a specific location and parameter for y months beginning x months from the current month. If y is 0 or BLANK, the function assumes 1 year. The value z is the type of monthly average used:

if z is 0 then the average is the arithmetic mean (average)
if z is 1 then the average is the geometric mean (for fecals)
if z is 2 then the average is the flow-weighted average

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter Y_MAXM([l:p],[l_flow:p_flow],x,y,z)

Examples:

Y_MAXM([Effluent:50050],0,0,0) = start current month, yearly maximum
Y_MAXM([Effluent:31614],-6,6,1) = previous 6 month maximum for fecals

The Maximum 3-Month Average (of monthly averages) may be specified by adding the additional parameter Y_MAXM([l:p],x,y,z,3)

14.18.8 Y_MIN([l:p],x,y)

Y_MIN([l:p],x,y)

Yearly **MIN**imum for location and parameter, offset x months, for y months

Value: The minimum of data values of a specific location and parameter for y months beginning x months from the current month. If y is 0 or BLANK, the function assumes 1 year.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter Y_MIN([l:p],[l_flow:p_flow],x,y)

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Examples:

Y_MIN([Effluent:50050],0,0) = start current month, yearly minimum
Y_MIN([Effluent:31614],-6,6) = previous 6 month minimum

14.18.9 Y_MINM([l:p],x,y,z)

Y_MINM([l:p],x,y,z)

Yearly **MIN**imum of **M**onthly averages for location and parameter, offset x months, for y months, average z

Value: The minimum of the monthly averages for a specific location and parameter for y months beginning x months from the current month. If y is 0 or BLANK, the function assumes 1 year. The value z is the type of monthly average used:

if z is 0 then the average is the arithmetic mean (average)
if z is 1 then the average is the geometric mean (for fecals)
if z is 2 then the average is the flow-weighted average

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter Y_MINM([l:p],[l_flow:p_flow],x,y,z)

Examples:

Y_MINM([Effluent:50050],0,0,0) = start current month, yearly minimum
Y_MINM([Effluent:31614],-6,6,1) = previous 6 month minimum for fecals

The Minimum 3-Month Average (of monthly averages) may be specified by adding the additional parameter Y_MINM([l:p],x,y,z,3)

14.18.10 Y_RES([l:p],x,y1,y2,y3,y4)

Y_RES([l:p],x,y1,y2,y3,y4)

Yearly **RES**idual carryover for location and parameter, offset x years, percents y1, y2, y3, y4

Value: The residual carryover of the yearly sums of data values of a specific location and parameter beginning x years from the current year. Beginning with the previous year and moving backward, each year's sum is multiplied by the y percentage for that year, and the total is returned as the residual.

Examples:

Y_RES([Effluent:50050],0,50,20,10,0) = residual carryover from previous years
Y_RES([Effluent:31614],1,50,20,10,0) = next year's residual

14.18.11 Y_SUM([l:p],x,y)

Y_SUM([l:p],x,y)

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Yearly **SUM** of daily values for location and parameter, offset x months, for y months

Value: The sum of data values of a specific location and parameter for y months beginning x months from the current month. If y is 0 or BLANK, the function assumes 1 year.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter Y_SUM([l:p],[l_flow:p_flow],x,y)

Examples:

Y_SUM([Effluent:50050],0,0) = start current month, yearly sum
Y_SUM([Effluent:31614],-6,6) = previous 6 month sum

14.18.12 Y_TOTM([l:p],x,y)

Y_TOTM([l:p],x,y)

Yearly sum of **M**onthly **TOT**als (average * number of days) for location and parameter, offset x months, for y months

Value: The sum of the monthly totals for a specific location and parameter for y months beginning x months from the current month. The total is defined as the average of values, multiplied by the number of days in the range. If y is 0 or BLANK, the function assumes 1 year.

If 256 is added to y, the count of days with flow data is used instead of the number of days.

When a parameter to calculate loading is specified (@, #, &, @@, ##, or &&parameter), a separate flow location (and parameter) may also be specified:
add the additional parameter Y_TOTM([l:p],[l_flow:p_flow],x,y)

Examples:

Y_TOTM([Effluent:50050],0,0) = start current month, yearly total
Y_TOTM([Effluent:31614],-6,6) = previous 6 month total

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Part

15 Utilities

Topics in this section include:

- Database Backup
- Import/Export Facility
- Operator10 Agent
- Calculate Utility
- Locked Data
- Import Utility
- Export Data Utility
- Calculator Tool
- Operator10 Tools

15.1 Database Backup

A **Backup** of all current Facility data files in the Operator10 - Wastewater can be made in a compressed file format (.zip). The data files of the current database are compressed and copied to the file location chosen by the user, with a name given by the user. The backup file can then be stored to an external source or location.

Database Backup - Manual

There are several ways in which the database can be backed up.

Backup Method #1 - Open Database window

1. To perform a database backup, click the **[Backup Selected Database]** button, located in the grid tool-strip, to begin.
2. In the Save As window that opens, select a location in which to store the backup file.
3. In the File name: field, give the backup file a suitable file name.
4. Press the **[Save]** button to perform the backup.

Backup Method #2 - Tools ribbon

1. To perform a database backup, go to the **Tools** menu/ribbon, click the **[Backup Now]** button.
2. In the Save As window that opens, select a location in which to store the backup file.
3. In the File name: field, give the backup file a suitable file name.
4. Press the **[Save]** button to perform the backup.

Database Backup - Scheduled

To schedule a backup, using the Operator10 Agent Scheduling tool, see the Scheduled

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Backup help topic.

15.2 Import/Export Facility

Users may Import or Export Facility data into and from existing databases. To begin the process of Importing or Exporting Facility data, go to the **File** menu and choose **Open Database**. Locate and click the **[Import/Export Facility]** button. The Import/Export Facility window will open, follow the steps below to Import or Export facility data.

Import Facility

When importing data, users will be able to create a new facility based on the selected export file from Operator10 - Wastewater. The new facility will be added to the current database.

1. Choose the **( ) Import Facility** option to begin.
2. Enter a new **Facility Name:** (1 to 30 characters).
3. Click the **[...]** button in the FileName field to choose the Exported facility file (*.zip) to be imported.
4. Click the **[OK]** button to import the facility.

Export Facility

When exporting data, the created file will be suitable for importing into other installations of Operator10 - Wastewater, importing into other databases in Operator10 - Wastewater as well as sending to AllMax Software Technical Support staff.

1. Choose the **( ) Export Facility** option to begin.
2. The **Facility Name:** field will be filled with the Facility you have chosen to Export.
3. Click the **[...]** button in the **File Name:** field to choose a file location and name the file to be saved as the Export file. (The file will be created in a zip or compressed file format, suitable for importing into Operator10 - Wastewater.)

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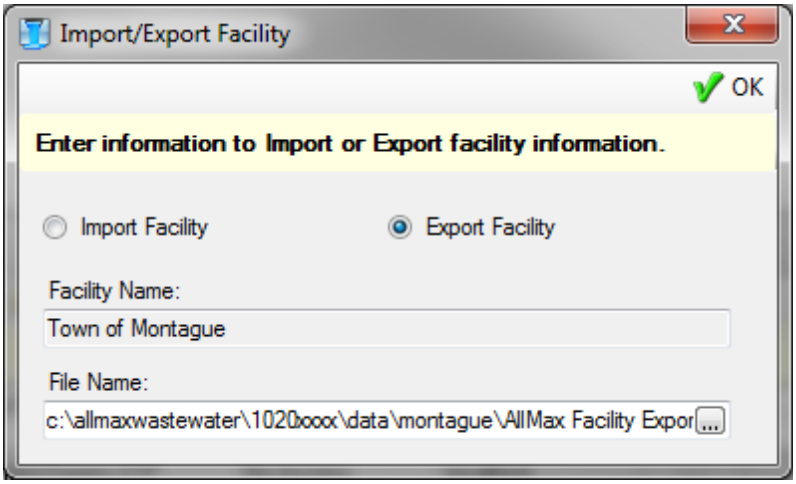
4. Click the **[OK]** button to import the facility.



15.3 Operator10 Agent

Operator10 Agent

The Operator10 Agent is an interactive Windows Service that runs silently in the background of the Windows Operating System.

The Operator10 Agent silently monitors configuration information which tells the service which scheduled tasks to perform. Based on selected servers and databases, scheduled tasks are performed based on the desired schedules, as set by the end user.

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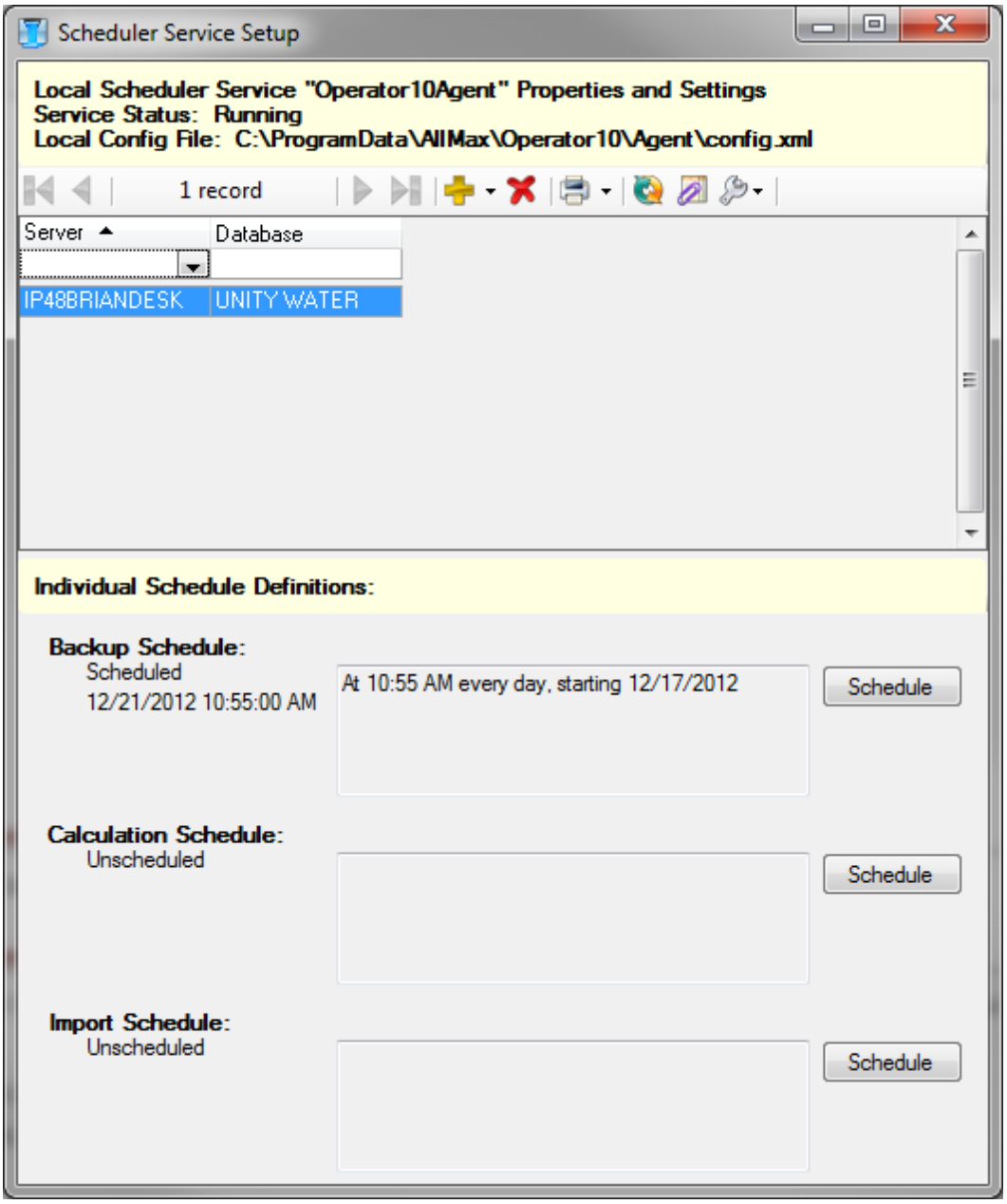

The Operator10 Agent performs scheduled task operations such as backups, calculations and data imports.

Accessing the Operator10 Agent

To access the Operator10 Agent information, go to the **Tools** menu, choose **Setup**.

Adding Server/Database to Agent

To instruct the Operator10 Agent to perform the scheduled tasks associated with backups, calculations or data imports, follow these steps:

1. Click the **[Add]** button to begin

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2. In the Server list that opens, select the server where the Operator10 Database resides
3. Click **[OK]**
4. In the Database list that opens, select the database to be processed when the Operator10 Agent performs the scheduled tasks
5. Click **[OK]**

Upon adding the server/database combination to the list, the scheduled tasks will be displayed.

NOTE: An additional security measure is required to establish the full connection of the Operator10 Agent to the server/database combination listed. The Database Properties option for **Include in Scheduler Check**. Enable the checkbox option for Include in Scheduler Check to finalize the connection.

Scheduled Tasks

From the Operator10 Agent Service Options window, the following tasks are available to be scheduled:

Scheduled Backups

1. In the area labeled **Individual Schedule Definitions** press the **[Schedule]** button for **Backup Schedule:** to begin
2. Enter the desired name of the file to be created in the **File Name:** file
3. Select the desired path where the backup file is to be created. Press the **[...]** button.
4. In the Multiple Backup Copies area:
   a. Check the **[ ] Create multiple backup copies** checkbox to create unique backup files that will have the date appended to the name of the file. **Example:** Operator10Backup_20121219.zip
   b. Select from the available options:
      i. **( ) Keep all backup files** - This option will preserve all backup files created at the selected location
      ii. **( ) Delete backup files after _____ Days** - Enter a numeric value and the backup process will remove any files that have been created via the scheduled backup utility that were created X number of days prior to the current date.
      iii. **( ) Delete backup files after _____ Months** - Enter a numeric value and the backup process will remove any files that have been created via the scheduled backup utility that were created X number of months prior to the current date.
5. Press **[Schedule Setup]** button to continue
6. In the Schedule dialog that opens, if this schedule is
   - New - press the **[New]** button to begin scheduling
   - Existing - proceed to the schedule information, step 5

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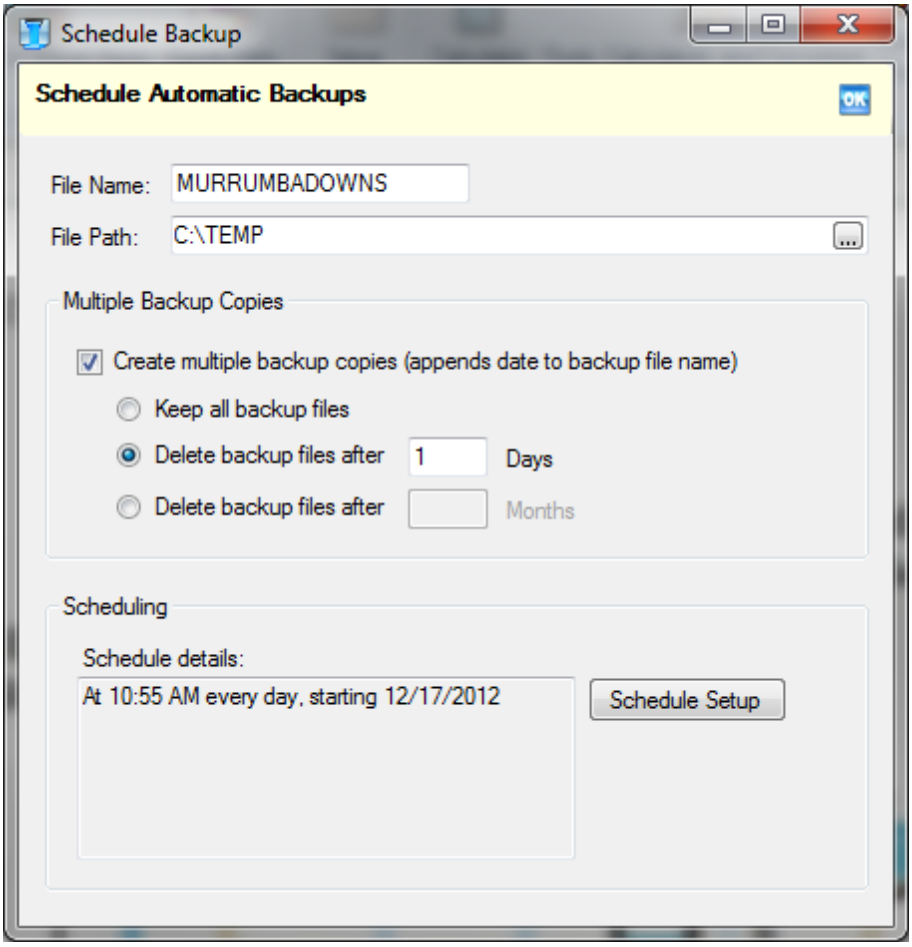
7. Select from the options in the Schedule Task menu to determine the frequency of the task
8. Provide additional information based on the choice of schedule frequency to continue
9. Click **[OK]** to continue
10. Press **[OK]** to complete the scheduling process



Your task is now scheduled and ready for processing with the Operator10 Agent, provided that you have added the server/database to the list to be processed.

Scheduled Calculation

1. Go to the **Tools** ribbon/menu and choose **Schedule** in the Calculations group to begin.
2. Choose the facility (multiple facilities can be selected) to be calculated
3. Enter a number of days from the current date to perform calculations
4. Press **[OK]** to continue
5. In the Schedule dialog that opens, if this schedule is
   - New - press the **[New]** button to begin scheduling

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- Existing - proceed to the schedule information, step 6

6. Select from the options in the Schedule Task menu to determine the frequency of the task
7. Provide additional information based on the choice of schedule frequency to continue
8. Click **[OK]** to continue

Your task is now scheduled and ready for processing with the Operator10 Agent, provided that you have added the server/database to the list to be processed.

Scheduled Import

1. Go to the **Tools** ribbon/menu and choose **Schedule Imports** from the menu to begin.
2. In the Schedule dialog that opens, if this schedule is
   - New - press the **[New]** button to begin scheduling
   - Existing - proceed to the schedule information, step 3
3. Select from the options in the Schedule Task menu to determine the frequency of the task
4. Provide additional information based on the choice of schedule frequency to continue
5. Click **[OK]** to continue

NOTE: The Import Utility relies on information provided in the Database Properties - Import Settings section, see the Import Settings for more information

Your task is now scheduled and ready for processing with the Operator10 Agent, provided that you have added the server/database to the list to be processed.

15.3.1 Calculation Schedule

The Calculation Schedule Utility allows for users to define and manage a schedule of tasks to calculate specified Facility data. The Calculation Schedule allows all formulas for a selected Facility to be calculated on a scheduled task basis with the help of the Operator10 Agent.

For more information see the following topics:

- Operator10 Agent
- Scheduled Calculations

15.4 Calculate Utility

Calculate Utility

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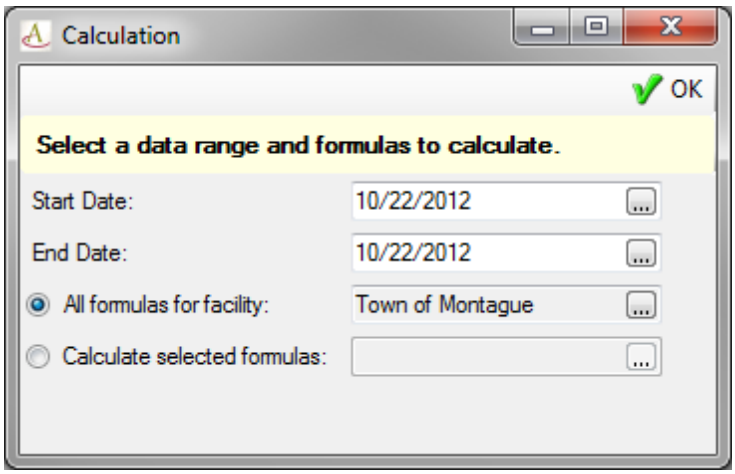
The Calculate Utility is used to perform calculations for a given database. The utility can calculate all formulas or a selection of formulas based on user provided date range.



Calculating

To perform a calculation, select/enter the following pieces of information:

- **Start Date:** Enter the date on which the Calculate Utility should begin performing calculations. Enter a date or click the **[...]** button to select using a calendar.
- **End Date:** Enter the date on which the Calculate Utility should end performing calculations. Enter a date or click the **[...]** button to select using a calendar.
- **( ) All formulas for facility:** Select this option and click the **[...]** button to select from a list of facilities, select one or multiple facilities, to have all formulas for the selected facilities calculated.
- **( ) Calculate selected formulas:** Select this option and click the **[...]** button to browse a list of formulas to be calculated. Select individual or multiple formulas to be calculated.

Click the **[OK]** button to begin calculating the database.

More information

For more information about calculations, see the following topic:

- Calculations
- Scheduled Calculations

15.5 Locked Data

Locked Data

Data may be Locked (protected) for any Facility. Locked Data allows data values to be viewed, reported, exported, and used in calculations, but does not allow data values to be changed within the Operator10 application.

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Select the **Facility** to lock data. Use the drop-down menu to choose the Facility for which you want to Lock Data.

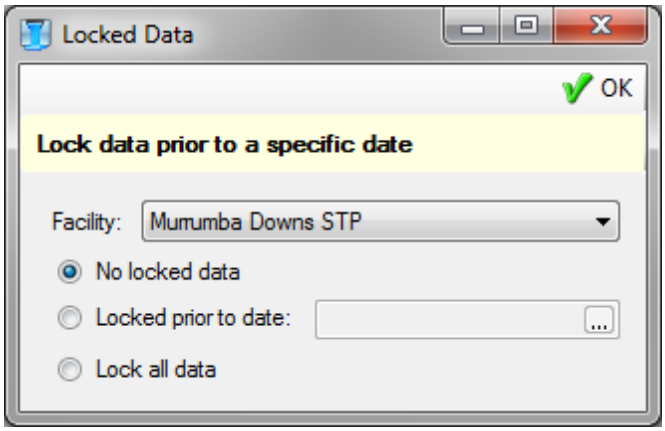
Select the **( ) No locked data** radio button to disable Data Locking and release all data for the current Facility.

To Lock Data prior to a specified date, select the **( ) Locked prior to date:** radio button and enter a date or press the **[...]** popup button to choose a date from a Calendar.

> ***NOTE:*** The use of Relative Dates is supported in the Locked Data feature. Using the Relative Date option will provide the facility with the ability to automatically lock data based on an entry relative to the current date.
>
> **Example: -60d (or -60)** will allow the database to lock data for the selected Facility 60 days prior to the current date.

To Lock All Data for the current Facility, select the **( ) Lock all data** radio button.

Click the **[OK]** button to make the changes for the current Facility.



15.6 Import Utility

Import Utility

The Operator10 - Wastewater **Import Utility** (ImportUtility.exe) allows seamless integration of data from other application into the Operator10 - Wastewater database, and may be used to import data to multiple Facilities. The utility must be run from the directory where the Operator10 - Wastewater Application (Operator10.exe) is located. It runs transparently, and can be run without interaction from the user. Basic information and all errors are recorded in the "Import.log" file.

Default Usage

The following information relates to the default usage of the ImportUtility.exe application:

- The data import file must named using the following file extension **.imp**

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- The data import file must be stored in the Database directory
- The notes import file must be named using the following file extension **.impnote**
- The notes import file must be stored in the Database directory

Custom Usage

To make use of custom settings, edit the Database Properties for Import Settings. The following information is provided in order to customize the usage of the ImportUtility.exe application:

- **Import files path:** - the path used by the ImportUtility to find and access files for importing; set this path by clicking the **[...]** button
- **Extension for import data files:** - the custom file extension used by the ImportUtility to seek out data import files (Examples: .txt, .csv, .imp, etc.)
- **Extension for import notes files:** - the custom file extension used by the ImportUtility to seek out notes import files (Examples: .note, .notes, .impnote, etc.)

The ImportUtility will read through the default database directory or the defined custom directory and process all files matching the .imp/.impnote (default) or user-defined file extensions. Users will now benefit from the ability to process multiple incoming files from LIMS, SCADA, Historian and other exported data files.

Data Import - File Structure

Each line in the data file must either be:

Blank
A comment, beginning with a semicolon (;) or tab
A data line consisting of:

A Date

A space and a Time (optional)

A comma (,) or tab

A Facility ID

A comma (,) or tab

A Location

A comma (,) or tab

A Parameter

A comma (,) or tab

A Data value

optionally, if the Data value is numeric:

A comma (,) or tab

A DataType number (See the **Data** help topic for more information about data types and equivalent values.)

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NOTES:

- There should be NO spaces before or after commas.
- Imported data fields may be enclosed in double (") or single (') quotes.
- All portions of the line must be valid in order for the import to succeed.
- The Date may be in any of the supported OP10 date formats.
- The Data value may be a numeric value, or a Less Than, Greater Than, Alpha Code, etc.

Example #1:

The following line:

```
09/01/00,001,Plant If,Flow MGD,1.600
```

imports a numeric daily data value of 1.6 into the Facility referenced as '001', using Location 'Plant If' and Parameter 'Flow MGD'.

Example #2:

The following line:

```
09/01/00 10:00,001,Plant If,Flow MGD,1.600
```

imports a numeric hourly data value of 1.6 into the Facility referenced as '001', using Location 'Plant If' and Parameter 'Flow MGD'.

Example #3:

The following line:

```
09/01/00,001,Plant Ef,BOD,2,2
```

imports a numeric daily data value of <2 (data type = '2', or less-than) into the Facility referenced as '001', using Location 'Plant Ef' and Parameter 'Flow MGD'. (See the **Data** help topic for more information about data types and equivalent values.)

Sampling Events Data

Sampling Events data can be imported using the ImportUtility.exe application. For more information, please see the following help topic: Import Sampling Events Data.

Data Notes Import - File Structure

A **secondary data file** named "**OP10Note.impnote**" may be imported into the Operator Notes database as Data Notes (QuickNotes). It must also reside in the License directory. Each line in the note file must either be:

Blank
A comment, beginning with a semicolon (;) or tab
A data line consisting of:

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A Date
A comma (,) or tab
A Facility ID
A comma (,) or tab
A Location
A comma (,) or tab
A Parameter
A comma (,) or tab
A Note (1 through 2000 characters)

> ***NOTE:***
>
> - Use a backslash character "\" to represent any ends of lines within the Note field.
> - Imported data fields may be enclosed in double (") or single (') quotes. Use quotes to enclosed notes which contain commas (,) in order to allow for proper import into database. Non-enclosed notes containing commas will cause the import utility to fail for the entered notes.

Example #1:

The following line:

```
09/01/00,001,Plant If,Flow MGD,"This is a data note.\This is a new line in my data note
```

imports a quick note into the database for the Facility referenced as '001', using Location 'Plant If' and Parameter 'Flow MGD'.

ImportUtility.exe Usage

The **Operator10 Import Utility** must be aware of the server and database to which the user will be importing data. This information can be provided in several ways.

- **Manually:** When running **ImportUtility.exe** as an application, i.e. double-clicking the application file ImportUtility.exe, a prompt for the Database/Facility window will appear and users are requried to select a server and database from this window. The utility will then begin the import.
- **Command line:** When creating a shortcut or running the import from a command line prompt, users may include the server and database in the command line as follows: **C:\AllMaxWater\Application\ImportUtility.exe "localhost,WATER"**

  In the above example the command-line parameters of localhost (server name) and WATER (database name) are provided to ensure correct import.
- **via Scheduling:** When using the Scheduled Import option (**Tools** ribbon/menu, **Import/Export Data** group, **Schedule Imports** button), server and database information is automatically included when the import is scheduled.

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- **Automatically:** When a user calls the ImportUtility from within a running Operator10 application, the program is aware of the current database and server on which the database is located. Call the Import Utility from the **Tools** ribbon/ menu, **Import/Export Data** group, **Import Now** button.
- **Browse for Import File(s):** Users may process one file at a time as desired utilizing the Import Browse functionality. Go to the **Tools** ribbon/menu, choose **Import/Export Data** group, and choose **Browse for Import File(s)** to browse for selected file(s) for import into the database.

NOTE: Import Browse will allow users to select files matching the defined (or default) file extensions as found in the Database Properties section.

15.6.1 Import Sampling Events Data

Import Sampling Events Data

The ImportUtility.exe application can be used to import data into the Sampling Events sections of the database. Data can be imported for the Sampling Event Location and Parameter sections respectively. Importing Sampling Events data makes use of the data import process with some adjustments to each line to be imported. See the Import Utility help topic for information on Default Usage and Custom Usage of the data import process.

Data Import - File Structure

Importing data as Sampling Events data requires each line to be slightly modified. The following information is provided as a guide to correctly import Sampling Events data.

Import Sampling Event Location Data (top-level grid of Sampling Events section)

Each line in the data file must either be:

Blank
A comment, beginning with a semicolon (;) or tab
A data line consisting of:

A Date
A space and a Time (optional)
A comma (,) or tab
A Facility ID
A comma (,) or tab
A Location
A comma (,) or tab
A Parameter field of **''** (**NOTE:** Parameter must be left empty **AND** the field be enclosed using single-quote (''))
A comma (,) or tab
A Sampling Event value
A comma (,) or tab

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Sampling Event field name containing one of the following phrases:
- COCNum
- Employee
- SampleType
- SampleNum
- SamplerNum
- CollectMeth
- LabCert
- SampTime
- Duration
- Status
- Comments
- CollPhone
- PwsIDNum
- FacCode
- SampPointID
- SampLocType

Import Sampling Event Parameter Data (lower-level grid of Sampling Events section)

Each line in the data file must either be:

Blank
A comment, beginning with a semicolon (;) or tab
A data line consisting of:

- A Date
- A space and a Time (optional)
- A comma (,) or tab
- A Facility ID
- A comma (,) or tab
- A Location
- A comma (,) or tab
- A Parameter
- A comma (,) or tab
- A Sampling Event value
- A comma (,) or tab
- Sampling Event field name containing one of the following phrases:
  - MethodNum
  - BottleNum
  - PreviousNum

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Special
AnalCompDate
AnalystNumber
Comments
DataQuality
DataQualReas
DataQualReslt
AnalStartDate
AnalStartTime
AnalCompTime
RunNum
BasisCode
QACode
PriorityReview
QCDate
AnalyteCode
AnalyticalLab

NOTES:

- Field names are taken verbatim from the field names as given in the database. For more information contact Technical Support at 800-670-1867.
- There should be NO spaces before or after commas.
- Imported data fields may be enclosed in double (") or single (') quotes.
- All portions of the line must be valid in order for the import to succeed.

Example #1:

The following lines:

```
09/01/00,001,Downstream,'',001-892111,COCNum
09/01/00,001,Downstream,'',BGS,Employee
09/01/00,001,Downstream,'',Grab,SampleType
09/01/00,001,Downstream,'',Grab,CollectMeth
09/01/00,001,Downstream,'',08:05,SampTime
09/01/00,001,Downstream,pH,441-B,MethodNum
09/01/00,001,Downstream,pH,09/01/00,AnalStartDate
09/01/00,001,Downstream,pH,10:00,AnalStartTime
09/01/00,001,Downstream,pH,No,Special
09/01/00,001,Downstream,pH,0023,BottleNum
09/01/00,001,Downstream,pH,No,PriorityReview
```

import several results into the Sampling Events section of the database for Location-level and Parameter-level data.

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15.7 Export Data Utility

Export Data Utility

The Export Data Utility allows users to create a simple export file, suitable for importing into Operator10 - Wastewater databases. The export file is created as an ASCII text, comma-separated values file. The file format is defined in more detail in the **Import Utility** help topic, see Import Utility for more information.

Create Export File

To begin creating an export file, go to the **Tools** ribbon/menu. Choose the **[Export Data]** button to begin. In the **Location:Parameter** list that opens, select Location:Parameters (as single or in multiple) and click the **[OK]** button.

Enter or select a date range from the Calendar dialog that opens, and click **[OK]**.

The Export Data Utility will process the information provided and create a data export file in the database directory.

> ***NOTE:*** The path to the database directory is able to be found using the Help | About dialog.

The name of the export file will be named as follows:

OP10Export_[date_of_export].exp

The export file can be opened with any text editor, such as Notepad, and modified if necessary.

15.8 Calculator Tool

Calculator Tool

The Calculator Tool allows users to perform evaluation of formulas, functions and other mathematical calculations prior to writing data to the database or attaching the formula to a Location:Parameter.

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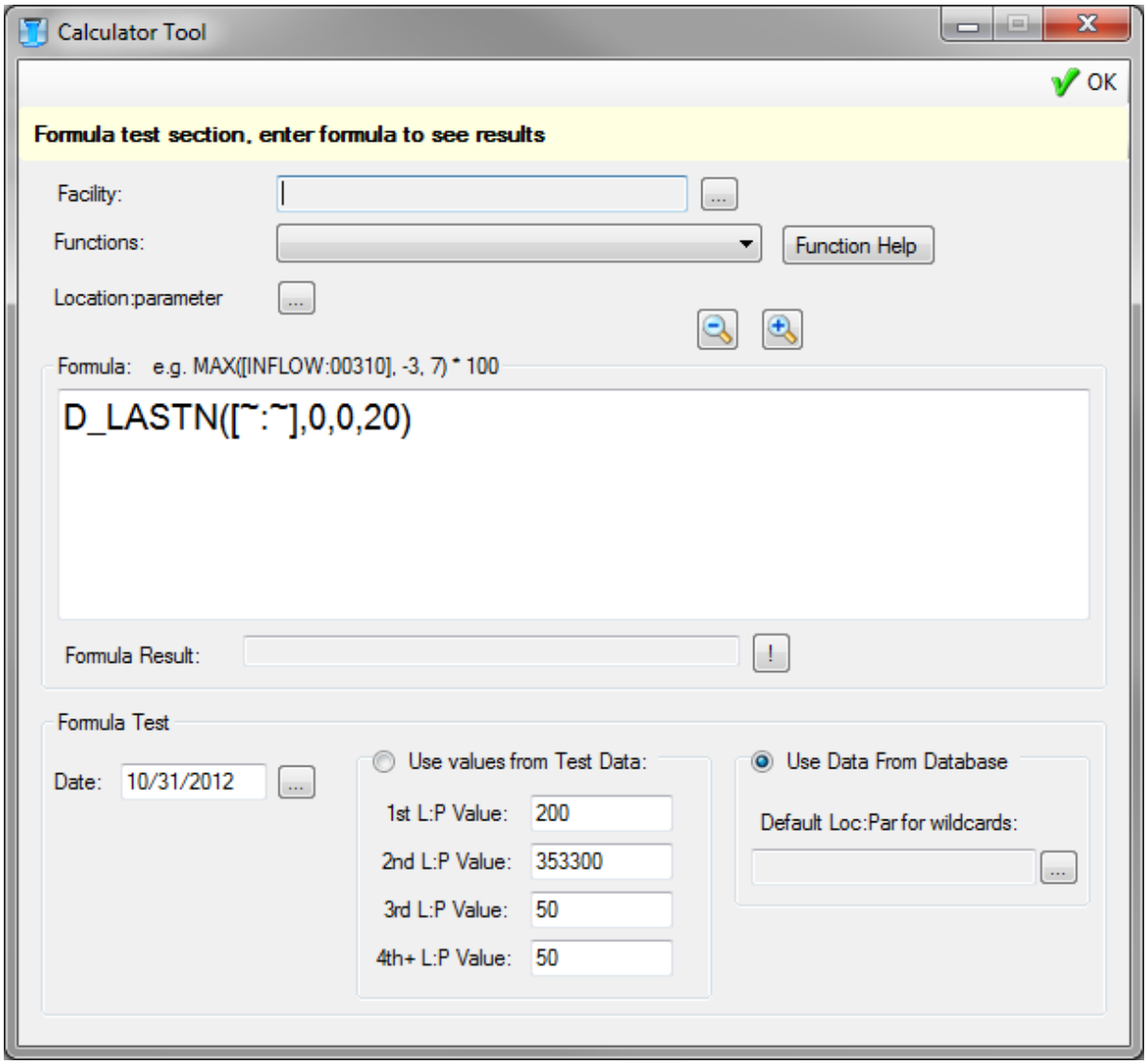

The Calculator Tool provides an area in which users can test possible formulas, functions and other mathematical calculations.

Accessing the Calculator Tool

To access the Calculator Tool, go to the Main Application window and find the **Tools** ribbon/menu. In the **Tools** ribbon, click the **[Calculator]** button to open the Calculator Tool.

For more information about usage, see the Formula List topic.

15.9 Operator10 Tools

Operator10 Tools

Several calculator-style Tools are available. In the main application, go to the **Tools**

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ribbon/menu, select **[Tools, Calculators, and Converters]** from the **Useful Tools** group.

Available tools, calculators and converters are presented on the left side of the window in the tree. Select from the available options and review necessary data/information on the right side of the window.

Enter appropriate information where required or press **[...]** to select information using PickList and/or Calendar dialogs. Calculated results are immediately shown.

> ***NOTE:*** Functions may be used in numeric entries: e.g. "10+(3*2.2)" may be entered in place of "16.6".

Available tools include:

- **Units Conversion**
- **Concentration x Time (CT)**
- **Lime/Soda**
- **Mineralization Residual**
- **Area/Volume**
- **Percent Solutions**
- **Flow Estimate**
- **Loading**
- **OPC/DDE**

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Index

- - -

- 433

- % -

% 430

- & -

& 389

- * -

* 430

- . -

.45359 395

- [-

[F:L:P] 387
[L:P] 387

- ^ -

^ 432

- | -

| 395

- ~ -

~ 101, 443
~CALC_LP 387

- + -

+ 425

- < -

< 101, 394

- = -

= 390

- > -

> 101, 390

- 1 -

1/x 428

- 3 -

3.7853 395
3320 298
3D View Properties 229

- 4 -

4-Day Average 123

- 5 -

5-Year Forecast Report 268
5-Yr Forecast 268

- 7 -

7-day 413, 492, 493, 495
7-Day Average 124

- 8 -

8.34 395

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- 9 -

90 degree Weir 452

- A -

About 23, 328, 361
ABS() 425
Absolute Value 425
Accrue 435
ACCRUE() 435
ACCUM() 471
Accumulate 435, 471
ACODE() 436
ACOS() 473
Add 30, 416, 417, 425, 434
Add Alpha Code 116
Add Alpha Codes 116
Add Chemical 118
Add Container 157
Add Data 98
Add DataView 170
Add Formula 109
Add Formulas 109
Add Limits 145
Add Link 342
Add Location 86
Add Location:Parameter 95
Add LP 95
Add new 30
Add Owner 144
Add Page 155
Add Parameter 90
Add Process 102
Add Report 242
Add Sampling Event 333
Add similar 30
Add Similar Limit 145
Add Similar Location 86
Add Similar Parameter 90
Add Similar Site 139
Add Site 139
Add Site Owner 144
Add special 30
Add() 425
Addition 425, 434
Admin Security 42
Administrator 42
After 401, 403, 405, 418, 459
All Functions 375, 380
AllMax Data Definition 344
AllMax Folder 358
AllMax Folder Software 356
Alpha 436
Alpha Code 100, 116, 386, 391, 436, 437, 451
Alpha Code List 116
ALPHA() 436
And 389
AND() 389
Angled Weir 452
Annual 500
Applicaiton List 149
Application 149, 364
Application Report 311
Application Values 151
Apply 436
APPLY() 436
Arccosine 473
Arcsine 474
Arctangent 474
Area 519
Arithmetic Mean 125
ASIN() 474
Assign 437
ASSIGN() 437
ATAN() 474
Audit Trail 49, 57
Automatic Scale 231
Available Nitrogen 151
Average 125, 126, 398, 399, 401, 402, 414, 418, 422, 425, 453, 457, 461, 472, 477, 482, 486, 492, 496, 497, 501
Average Percent Reduction 461
Average Percent Removal 461
Averages 123, 124, 125, 126, 127
Avg 398, 402, 414, 425, 453, 457, 472, 477, 482, 486, 492, 496, 497, 501
AVG() 425
A-Z 380

- B -

Background 165
Background Image 165

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Backup 503
Backup Schedule 505
Barcode 119
Barcode Label 119
Barcode Name 121
Barcode Template Name 121
BarCodes 369, 371
Base 438, 443
Before 401, 402, 403, 418, 459
BIN() 438
Binary 438, 443
BioSolid 136
BioSolid Application 149
BioSolid Application List Report 311
BioSolid Application User Values 151
BioSolid Available Nitrogen 151
BioSolid Limit Report 322
BioSolid Limits 145
BioSolid List 136
BioSolid Nutrient Report 316
BioSolid Owner 144
BioSolid Owner List 144
BioSolid Site 139
BioSolid Site Detail 142
BioSolids 136, 149
BioSolids List 136
BioSolids Nutrient 148
BioSolids Nutrients 148
BioSolids Ribbon 62
BioSolids Sites 139
BioSolids Units 75
Bit mask 390
BIT() 390
Blank 386, 391, 395, 396, 431, 451, 466
BLANK() 395, 396
Block Summary 209
Boolean 389, 390, 391, 392, 393, 394, 395, 446, 449
Boolean Functions 389
Branching 390, 446, 449

- C -

Cake 136
Cake BioSolid 136
Calculate 121, 509
Calculate Now 121
Calculate Utility 509
Calculation 121
Calculation Constants 75
Calculation Order 121
Calculation Parameters 75
Calculation Schedule 505
Calculations 519
Calculator Tool 518
Calendar 47, 220, 256, 361
Calendar Quarter 472
Calendar Year 497, 498
Carryover 500
Change 398, 399, 400, 401, 405, 420, 454
Change Facility 57
Chapter 94 268
Characters 436, 451
Chemical 118
Chemical List 118
Chemicals 118
Cipolletti Weir 452
Citect 347
CJP 486
Client 19
Client/Server 19
Close Graph 224
Coefficient 406, 462
Column Header 198
Commands 372
Comment 368
Comments 202, 257, 337
Compare 398, 454
Compliance Judgement Point 486
Concentraion x Time 440
Concentration Units 75
Concentration x Time 438, 439, 445
Conditional 390, 446, 449
Conduit 364
Confidence Interval 406, 462
Config 23
Configuration 23
Configuration File 23
Constant 396
Constants 226, 395, 438, 440, 443, 449
Constants Editor 226
Contact 26
Contact Time 438, 439, 440, 445
Container Page 155
Containers 157, 159, 161, 163
Contents 17

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Contracted Weir 452
Control L:P 415
Converions 519
Conversion 438, 440, 443
Convert 438, 440, 443
Copy 373
Copy As 230
Copy As Bitmap 230
Copy As Data 230
Copy As Metafile 230
Copy Graph 230
Copyright 28
Correlation 406, 462
COS() 474
Cosecant 474
Cosine 473, 474
Cost 118
Count 398, 425, 446, 449, 454, 478, 480, 498
COUNT() 425
Covariance 406, 462
Create Calculation Parameters 139
Create Calculations 104
Create DataView 170
Create New View 153
Create Process Calculations 104, 107
Credits 26
CSC() 474
CT 438, 439, 440, 445, 519
CT() 438
CTI() 439
CTR() 440
Custom Report 259
Custom Report from DataView 259
Custom Report from DV 259
Custom Reports 259
Custom Tools 67
Cut 373
CVT() 440
CYL() 442
Cylinder 442

- D -

D_AVG() 398
D_COMP() 398
D_COUNT() 398
D_FLOW() 399
D_FWA() 399
D_GAUGE() 399
D_GMENA() 400
D_IGAUGE() 400
D_IMTR() 401
D_INTER() 401
D_LAST() 402
D_LASTN() 402
D_LASTNM() 402
D_LASTNN() 403
D_LASTNP() 403
D_LOADING() 404
D_MAX() 404
D_METER() 405
D_MIN() 405
D_NEXT() 405
D_STAT() 406
D_STDEV() 407
D_SUM() 408
D_TOTAL() 408
D_VAL() 408
Daily 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 446, 447
Daily Data Functions 397
Daily DataViews 168
Daily Values DataView 173
Dashboard 153, 154, 155, 157, 159, 161, 163
Dashboard Ribbon 58
Data 98, 99, 100, 101, 172, 386, 391, 392, 437, 451
Data Comments 202
Data Containers 157
Data Entry 172, 362, 366, 370
Data Export 205
Data Functions 375, 397, 413, 452, 471, 472, 475, 492
Data Note 368
Data Notes 202, 337
Data Permissions 45
Data Type 447, 451, 466
Data Types 451
Data Value 100
Data Window 235
Database 68, 73
Database Backup 503
Database Properties 75
Database Security 42
Database Structure 73
Database Timeout 75
Database Utilities 79, 80, 81

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DataPort 119, 355, 356, 357, 361, 364, 366
DataPort Application 364
DataPort Setup 356
DataPort Sync 355
DataView 168, 169, 170, 171, 172, 173, 174, 175, 180, 182, 189
DataView Application 189
DataView Block Summary 209
DataView Column 182
DataView Column Header 198
DataView Column Icons 199
DataView Column Properties 182
DataView Column Setup 180
DataView Columns 172, 180
DataView Data Entry 172
DataView Data Export 205
DataView Edit Ribbon 193
DataView File Menu 190
DataView Find Data 201
DataView Freeze Column 207
DataView Group Header 198
DataView Home Ribbon 191
DataView Icons 199
DataView Import 204
DataView Keyboard Shortcuts 196
DataView List 169
DataView Logged Documents 131
DataView Name 171
DataView Properties 177
DataView Right-Click Menu 207
DataView Tools Ribbon 195
DataView Window Ribbon 196
DataViews 168, 169, 170
Date 47, 101, 256, 361, 366, 386, 392, 409, 410, 411, 412, 413, 451, 455
Date Data 101
Date Functions 409
Date Reported 253
DATE() 409, 455
Day 409, 411
Day of Month 410
Day of Week 410
Day of Year 411
Days in Month 411
DDE 340, 341, 342, 343, 467
DDE Client 340
DDE Link 342
DDE Link Name 344
DDE Linking 467, 468, 469
DDE Server 340, 345
DDE() 467
DDE_P() 468
DDE_X() 469
Decay 500
Decimal 432, 433, 434
Default 426, 427
DEFAULT() 426
Delete 30, 370
Delete Chemical 118
Delete Database 72
Delete DataView 171
Delete Facility 72
Delete Formula 111
Delete Formulas 111
Delete Location 87
Delete Location:Parameter 96
Delete LP 96
Delete Parameter 91
Delete Process 102
Delete Sampling Event 334
Delta 398, 454
Deviation 407, 422, 464
Difference 398, 454
Digits 432, 433, 434
Direct Access 240
Discharge Monitoring Report 298
Disinfection 438, 439, 440, 445
DIST() 426
Distribution 426
DIV() 426
Divide 416, 417, 426
Division 426
DMR 298
DMR 3320 298
DOM() 410
DOW() 410
DOY() 411
DP 355
Duration 102, 481
DV 168
DV Column Properties 182
DV Columns 172
DV Display Options 177
DV Format 177
DV Properties 177
DVAL() 411

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DVs 168
Dynamic Data Exchange 340
Dynamic Data Exchange (DDE) 467

- E -

e 395
e^x 426
E_SUM() 476
Earlier 401, 402, 403, 418
Edit 30, 40, 373
Edit Label 119
Edit Link 342
Edit multiple 30
Edit Process 102
eDV 211
eDV Viewer 211
Electronic DataView 211
Email 57
Enabled 344
English 440
Entering Data 362, 366
Equal 390
EQUAL() 390
Equality 390
Even-Biased Rounding 126, 433
Exceed 476
Excel 347, 467, 468, 469
Exceptions 257
Exclusive Or 395
Execute 469
Exit 57
EXP() 426
Exponential 426, 432
Export 30, 364, 468, 470
Export Data Utility 518
Export Facility 504
Export L:Ps 355
Export Location:Parameters 355

- F -

FAC() 443
Facility 83, 223, 366, 368, 443
Facility Export 504
Facility Import 504
Facility Security 43
Facility:Location:Parameter 387
FACT() 427
Factorial 427
FALSE 395
Fecal 392
Fecal Parameters 75
Federal DMR 298
File Menu 57
Filtering 38
Find 30, 368, 427
First 405, 427
FIRST() 427
Flow 392, 399, 452
Flow Estimate 519
Flow Parameters 75
Flow-Weighted Average 125, 399
Follow 401, 405, 418
Fonts 231
Form Date 253
Formatting Options 177
Formula 108, 109, 111, 113, 443
FORMULA() 443
Formulas 108, 111, 113
FRAC() 427
Fraction 427
Fractional 427
Freeze 36
Freeze Column 207
Frequency 257
Full Custom Report 259
Functions 108, 375, 389, 397, 409, 413, 424, 434, 452, 467, 471, 473, 475, 492, 496
Future 401, 405, 418
FWA 399

- G -

Gauge 399, 400
Gauge Containers 161
Gauge Reading 399, 400
General Properties 75, 228
Geo Mean 126
Geometric Mean 126, 400, 418, 456
Geometric Mean Type 75
gmean 418
Graffiti 362, 372
Graph 217
Graph 3D View Properties 229

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Graph Balloons 222
Graph Constants 226
Graph Containers 159
Graph Data 218
Graph Data Range 222
Graph Data Source 218
Graph Data Type 222
Graph Data Window 235
Graph Date 220
Graph Date Range 220
Graph Display Zoom 236
Graph Facility 223
Graph Fonts 231
Graph General Properties 228
Graph Help About 237
Graph Legends 232
Graph Limits 227
Graph List 217, 218
Graph Logged Documents 133
Graph Main Toolbar 238
Graph Palette Bar 237
Graph Pattern Bar 237
Graph Properties 228
Graph Scale 231
Graph Scale Properties 229
Graph Series Properties 228
Graph Titles 230
Graph Tools 222
Graph Type 221
Graph X Legend Gap 234
Graphing 217
Graphs 217
Greater Than 101, 386, 390, 392, 447, 451, 466
Greater Than Data 101
Greatest 403, 459
Grid 30
Grid Columns 36
Grid Print 40
Grid Toolbar 30
Group 30
Group Header 198
Grouping 30, 38
Groups 375
Growth 398, 454
GT() 390

- H -

H_AVG() 414
H_CALC() 415
H_COMB() 416
H_COUNT() 416
H_FUNC() 417
H_GMEAN() 418
H_INTER() 418
H_MAX() 419
H_MED() 419
H_METER() 420
H_MIN() 421
H_PRTPWR() 421
H_STD() 422
H_SUM() 423
H_VAL() 423
Header/Footer 188
Help 23, 362, 373
Help | About 328
Help About 237
Help File Conventions 27
Help Ribbon 66
HEX() 443
Hexadecimal 443
Hide Column 36
Highest 403, 459
HLIME() 444
Hotspot Options 165
HotSpots 155
HotSync 355, 364
Hour 372, 394
Hourly 393, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 455, 466, 481
Hourly Calculation 415
Hourly Data Functions 413
Hourly DataViews 168
Hourly Values 331
Hourly Values DataView 174

- I -

Icons 251
IDIST() 427
If 390, 446, 449
IF() 390

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iFix 347
Import 467, 469
Import Data Utility 511
Import DataView Data 204
Import Facility 504
Import Schedule 505
Import Settings 75
Import/Export Facility 504
In Service 106
Include 444
Include in Scheduler 75
INCLUDE() 444
Increase 398, 454
Install 19, 357, 364
Install DataPort Software 357
Installation Guide 19
INT() 428
Integer 428
Intellution 347
INTER() 428
Intercept 406, 462
Interface 340
Internal Calculations 113
Internal Formula 108
Internal Formulas 108, 113
Interpolate 400, 401, 418, 428
Interpolated 428
InTouch 347
INV() 428
Inverse 428
Inversion 428
ISALPHA() 391
ISBLANK() 391
ISDATE() 392
ISFECAL() 392
ISFLOW() 392
ISGREAT() 392
ISHR() 393
ISLESS() 393
ISLP() 393
ISND() 394
ISTIME() 394
Item 345

- J -

Julian 409, 411

- K -

Key 366
Keyboard Control 196
Keyboard Shortcuts 196
Keycode 22
KeyPad 366

- L -

L&L 247
L:P 92
L:P Permissions 45
Land Application 149
Last 401, 402, 403, 418
Later 401, 405, 418
Least 403, 459
Legend Box Size 234
Legends 232
Length of Month 411
Length of Year 411
Less Than 101, 386, 393, 394, 437, 447, 451, 466
Less Than Data 101
Level 399, 400
LI 438, 440
LI() 445
License 22
License Database 22
Lime 444, 448
Lime-Soda 444, 448, 450
Limit 428, 434, 448, 449, 475, 476, 477, 478, 480, 481, 482, 484, 485, 486, 487, 489, 490, 491
Limit Report 287, 322
LIMIT() 428
Limits 227
Limits Editor 227
Linear Regression 222, 406, 462
Link 344
Link Data 344
Link Examples 347
Link Schedule 346
Link Server Definition 345
Linking 467, 468, 469, 470
Links 342
Liquid 136
Liquid BioSolid 136

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List 368
List and Label 247
LN() 429
Loading 107, 404
Loadings 107
Location 84, 86, 87, 366, 368, 387, 393
Location:Parameter 92, 95, 96, 364, 368, 387, 392, 393
Location:Parameters 172, 180
Lock and Load 247
Lock Data 510
Locked Data 510
Log 350, 429
Log Document 129
Log File 350
Log Inactivation 438, 440, 445
LOG() 429
LOG_REM() 429
Logarithm 429
Logarithm Removal 429
Logarithmic Mean 400, 456
Logged Docs 127, 129, 131, 132, 133
Logged Document 127, 129, 131, 132, 133
Logged Document List 127, 129, 131, 132, 133
Logged Documents 75, 127, 129, 131, 132, 133, 256
Logged Documents Options 75
Login 51
LOM() 411
Look Up 446, 449
LOOK() 446
Lower Limit 287
Lowest 403, 459
LOY() 411
LP 92, 95, 96, 180
LP() 387
LPs 172
LT() 394

- M -

M_AVG() 453
M_COMP() 454
M_COUNT() 454
M_COUNTH() 455
M_DATE() 455
M_GMEAN() 456
M_MAX() 456
M_MED() 457
M_MIN() 458
M_NTH() 459
M_PCT() 460
M_REM() 461
M_STAT() 462
M_STDEV() 464
M_SUM() 464
M_SUM2() 465
M_SUMH() 466
M_TOTAL() 466
M_TYPE() 466
Main Window 366
Market Value 148
Mass Balance 281
Mass Balance Report 281
Mathematical Functions 424
Max 403, 404, 416, 417, 419, 430, 456, 459, 484, 486, 487, 489, 493, 498, 499
MAX() 430
Maximum 403, 404, 416, 417, 419, 430, 456, 459, 484, 486, 487, 489, 493, 498, 499
Mean 125, 126, 400, 418, 425, 453, 456, 492, 496, 497
Med 419
Median 402, 419, 457
Menu Bar 358, 367
Meter 401, 405, 420
Meter Reading 401, 405, 420
Metric 440
Middle 402, 419, 457
Min 403, 405, 416, 417, 421, 430, 458, 459, 482, 485, 490, 491, 495, 499, 500
MIN() 430
Mineralization 500, 519
Minimum 403, 405, 416, 421, 430, 458, 459, 482, 485, 490, 491, 495, 499, 500
Minimumax 417
Minus 398, 433, 454
Minute 394
Miscellaneous 446
Miscellaneous Functions 434
MOD() 430
Modulus 430
Month 409, 411
Month of Year 412
Monthly 446, 447, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 464, 465, 466, 476, 496, 497, 499, 500, 501

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Monthly Average 461
Monthly Data Functions 452
MOY() 412
MUL() 430
Multi-Edit 30, 40
Multiple Data Values 331
Multiple Violations 481
Multiplication 430
Multiply 416, 417, 430
Multi-Year Summary Report 275

- N -

Natural Logarithm 429
Navigate 30
Navigation 30, 155
Navigation Containers 163
Nested If 390
NetDDE 353
New Database 69
New DataView 170
New Event 330
New Facility 71
New Graph 224
New Label 119
New Process 102
New Report Availability 244
New Sampling Event 333
New User 42
New View 153
Next 401, 405, 418
No data 396
Node 345
Nonblank 426, 427
Non-Blank 431
NONBLANK() 431
Non-Detect 101, 386, 394, 447, 451, 466
Non-Detect Data 101
Non-Zero 431
NONZERO() 431
Normal Distribution 426
Not 394
NOT() 394
Note 368, 386, 446, 451
NOTE() 446
Notes 337
NOW 395
nth 403, 446, 449, 459
Number 398, 416, 425, 454, 478, 480, 498
Numbers 366
Numeric 386, 451
Numeric Data 100
Nutrient List 148
Nutrient Report 316

- O -

OLE for Process Control 340
OLE for Process Control (OPC) 467
ONCE() 446
ONCEW() 447
OPC 340, 341, 342, 343, 467
OPC Client 340
OPC Link 342
OPC Link Name 344
OPC Linking 469, 470
OPC Server 345
OPC() 469
OPC/DDE 340, 341, 342, 343, 344, 345, 346, 347, 348, 350, 351
OPC/DDE Error 350
OPC/DDE Error Codes 350
OPC/DDE Errors 350
OPC/DDE Functions 467
OPC/DDE Links 342
OPC/DDE Log 350
OPC/DDE Server 351
OPC/DDE Server Functionality 351
OPC/DDE Setup 342, 348
OPC_W() 470
Open Database 57
Open Graph 224
Operator Log 337
Operator Notes 337
Operator10 Agent 505
Operator10 Help 57
Operator10 Options 67
Operator10 Tools 519
Operators Log 337
Option 447
OPTION() 447
Options 57, 67, 165
Or 395
OR() 395
Out of Service 106
Owner 144

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Owner List 144

- P -

Page 155, 165
Page Features 155
Page Options 165
Pages 154, 155
Palette Bar 237
Parameter 88, 90, 91, 366, 368, 387, 392, 393
Part 402
Particle Power 421
Particles 421
Past 401, 402, 403, 418
Paste 373
Pattern Bar 237
PCT_REM() 431
Pennsylvania Chapter 94 268
Percent 461
Percent Reduction 461
Percent Removal 431, 461
Percent Strength 118
Percentile 403, 460
Period 480
Pervasive 82
Pervasive Database 19, 82
Pervasive Database Engine 82
pi 395
PickList 30, 242, 368
Plant Available Nitrogen 151
Poke 468
Population Standard Deviation 127
Popup KeyPad 366
Positive 425
Power 432
PRE_LMT() 448
PREC() 431
Precision 431
Preferences 358, 369
PreTreatment 448
Previous 401, 402, 403, 418
Print 30, 40, 225, 240
Print Barcode 119
Print Graph 225
Print Grid 40
Print Label 119
Print Preview 253
Print Properties 184, 185, 187, 188
Print Properties Footer 188
Print Properties Header 188
Print Properties Margin 187
Print Properties Options 184
Print Properties Page 185
Print Report 252
Print Sampling Event 335
Prior 401, 402, 403, 418
Process 106, 471, 472
Process Control 102, 104
Process Create Calculations 107
Process Section Data Functions 471
Process Section History 106
Process Setup 104
Properties 240, 245
PSQL 82
PWR() 432

- Q -

Q_CSUM() 472
Q_SUM() 473
QLIME() 448
Quarterly 472, 473
Quarterly Data Functions 472
Quick Access 56
Quick Access Toolbar 56
Quick Note 368
Quick Notes 202, 337

- R -

RAND() 432
Random 432
Range 449, 455
RANGE() 449
Rank 402, 403, 457, 459, 460
Rebuild Tables 80
Recent 402
Rectangular Weir 452
Reduction 461
Refresh 227
Refresh Graph 227
Registry 81
Registry Entries 81
Regression 406, 440, 445, 462
Relative Dates 48

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Remainder 427, 430
Remarks 257
Removal 107, 429, 431, 461
Removals 107
Remove Link 342
Remove Record 370
Rename 30, 79, 240, 245
Rename Facility 79
Rename Facility Directory 79
Rename Formula 79
Rename Location 79
Rename Location:Parameter 79
Rename LP 79
Rename Report 245
Report Calcs 246
Report Calculation 246
Report Date 253, 255
Report Folder 242, 250
Report Folder Icons 251
Report Folders 250
Report Guidance 250
Report Guidance Documents 250
Report Logged Documents 132
Report Name 245
Report Prep 240
Report Preparation 252
Report Preperation 240
Report Print Date 253
Report Properties 245
Report Setup 245
Report Types 258
Report Verification 257
Reporting 240, 242, 244, 245, 246, 250, 251, 252, 253, 255, 256, 257, 258, 259, 268, 275, 281, 287, 292, 298, 311, 316, 322, 328
Reset Column 182
Reset DataView Column 182
Reset DV Column 182
Residual 500
Results 98, 331
Review Data 99, 370
Right-click 38
Right-Click Menu 207
Root 433
Round 431, 432, 433, 434
ROUND() 432
ROUNDE() 433
Rounding 431, 432, 433, 434
Rounding Rule 75
Rounding Rules 126
RSLinx 347

- S -

S_AVG() 472
S_SUM() 472
Sample Database 69
Sample Standard Deviation 127
Sampling Event 330, 331, 334, 335
Sampling Event Detail 331
Sampling Event List 330
Sampling Events 330, 331
Sampling Point 448
Save 224, 437
Save As 224
Save Data 366
Save Graph 224
SCADA 340, 469
Scale Properties 229
Scanner 366, 369, 371
Scanner Preferences 369
Scanning 369, 371
Schedule Backup 503
Seats 22
SEC() 475
Secant 475
Section 471, 472
Section Data Functions 471
Section History 106
Security 41, 57, 359
Select 368
Select All 373
Series Legend Box Size 234
Series Properties 228
Server 19, 345
Service 505
Service Agent 505
Service Setup 57
Set Variables 395
Setting Variables 449
Setup 57, 245, 342, 348, 364
Setup Ribbon 61
SETVAR() 395, 449
Shortcuts 367, 372
Show Column 36
Show/Hide 36

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Significant Digits 431
Significant Non Compliance 486, 487, 489, 490, 491
SIN() 475
Sine 474, 475
Site Detail 142
Site Limits 145
Site Owner 144
Sites 139
Slope 406, 462
SNC 486, 487, 489, 490, 491
SNC_CJP() 486
SNC_MAXD() 487
SNC_MAXM() 489
SNC_MIND() 490
SNC_MINM() 491
Soda Ash 450
SODA() 450
Softening 444, 448, 450
Sort 402, 403, 457, 459, 460
Sorting 38
Specific Gravity 118
SQRT() 433
Square Root 433
Squares 406, 462
Standard Deviation 127, 407, 422, 464
Standard Deviation Type 75
Standard Location 87
Standard Location Name 87
Standard Normal Distribution 426
Standard Rounding 126
Start DDE 343
Start OPC 343
Statistics 406, 462
Stock Parameter 91
Stock Parameter Name 91
Stop DDE 343
Stop OPC 343
Sub 398, 416, 417, 433, 454
SUB() 433
Subtract 398, 416, 417, 433, 454
Subtraction 433
Sum 406, 408, 416, 423, 434, 435, 462, 464, 465, 466, 472, 473, 476, 498, 500, 501
SUM() 434
Summary DataViews 168
Summary Values DataView 175
Support 26
Support Menu 27
Support Ribbon 65
Suppressed Weir 452
System Properties 26

- T -

Table Properties 80
TAN() 475
Tangent 474, 475
Tank 399, 400
Technical Support 26
Text 446
Then 390, 446, 449
Time 49, 102, 366, 372, 386, 394, 451
Time Data 102
Time of Day 102
Tips 373
Titles 230
Toolbar 238
Tools 30
Tools Ribbon 63
Topic 345
Total 408, 423, 434, 435, 464, 465, 466, 472, 473, 476, 498, 500, 501
Trapezoidal Weir 452
Trigonometric 473, 474
Trigonometry 473, 475
Trigonometry Functions 473
TRUE 395
True/False Functions 389
TRUNC() 434
Truncate 432, 433, 434
Truncated Rounding 126
Type 257, 386, 447, 451, 455, 466
TYPE() 451

- U -

Undo 373
Unfreeze 36
Units 440
Units Conversion 519
Updates 19
Upper Limit 287
Usage 399, 400
Use Whole Periods 179
User Defined Parameters 139

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User Facility Security 43
User Groups 45
User Security 41, 42
User Security Groups 45
User Values 151

- V -

V_AVG() 477
V_CNT() 478
V_CNTP() 480
V_DLY() 481
V_DLYM() 481
V_MAV() 482
V_MAX() 484
V_MIN() 485
VAL() 451
Valid 391, 392, 393
Valid Location:Parameter 393
Value 408, 423, 451
Values 98, 395
Var 395
Variable 347
Variables 395, 449
Variance 406, 462
Verify 428, 434
VERIFY() 434
Version 361
View 347
View List 154
View Name 154
View Ribbon 59
Views 153
Violation 287, 428, 434, 476, 477, 478, 480, 481, 482, 484, 485, 487, 489, 490, 491
Violation Data Functions 475
Volume 442, 519
V-shaped Weir 452

- W -

W_AVG() 492
W_MAX() 493
W_MIN() 495
WDOM() 413
Week 413
Week Day of Month 413
Week of Month 413
Weekly 447, 455, 492, 493, 495
Weekly Data Functions 492
Weekly Summary Report 292
Weir 452
WEIR() 452
Welcome 17
Windows Login 51
WOM() 413
Wonderware 347
Workgroup 19
Workstation 19
Write 437, 470

- X -

X Legend Gap 234
xor 395
XOR() 395

- Y -

Y_AVG() 496
Y_AVGM() 497
Y_CAVG() 497
Y_COUNT() 498
Y_CSUM() 498
Y_MAX() 498
Y_MAXM() 499
Y_MIN() 499
Y_MINM() 500
Y_RES() 500
Y_SUM() 500
Y_TOTM() 501
Year 409, 411, 413
Yearly 496, 497, 498, 499, 500, 501
Yearly Data Functions 496
YR() 413

- Z -

Zero 431
Zoom 236

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